THE AMERICAN

JOURNAL OF PHARMACY.

SEPTEMBER, 1884.

PRECIPITATES IN FLUID EXTRACTS.[1]

By J. U. Lloyd.

Read at the thirty-second annual meeting of the American Pharmaceutical Association at Milwaukee, and communicated by the author.

In our last paper (for a brief abstract see "Am. Jour. Phar.," 1883, p. 586) we were led to bring forward an experiment, wherein by evaporating a solution of a mixture of the salts, chloride of sodium and chloride of ammonium, a separation of these substances was effected—one (chloride of sodium) being deposited near the bottom of the evaporating dish; the other (chloride of ammonium) being mostly deposited at the surface of the liquid, or even above the surface line, by the familiar creeping process. The examination of these deposits demonstrated that the lower part of the lowest deposit was more than half chloride of sodium, while the upper deposit contained but two-thirds of one per cent. of

[1] *Query.*—"Is there any method whereby a solvent can be perfectly freed from a substance in solution, without evaporating the liquid, precipitating the dissolved matter in an insoluble form, or changing the liquid (as adding alcohol to water)?"

This question was addressed to several of our foremost scientists, and without any information being furnished as to another known method. In connection with this subject, it is proper to state that for many years it has been known that charcoal will separate certain organic matters from solution; and, according to the experiments of Mr. Witt (1856), it was shown that 22 per cent. of chloride of sodium was taken from a solution of that substance by filtration through $1\frac{3}{4}$ feet of sand. These facts are related to the experiments which follow, and to which we can find none similar on record. Indeed, quotations from our acknowledged authorities show that the phenomenon herein brought forward has been generally overlooked. We will cite as follows:

Filtration.—"The mechanical separation of a liquid from the undissolved particles floating in it."—*Ure.*

"The separation of suspended matter is effected on the small scale for laboratory purposes by filtration through porous paper."—*Roscoe & Schorlemmer.*

"The mechanical separation of fluid from solid matters mixed with them. The pores of the paper permit the fluid to pass through; whilst the solid matter, being prevented, remains behind."—*Galloway.*

chloride of sodium. The question that presents itself is, can solutions of salts separate from each other after being mixed? In continuing this subject, we shall confine ourselves to a phase closely connected with the foregoing experiment. The experiments tabulated herein were made more than a year ago. If we had written this paper before passing to other experiments, doubtless we should have permitted ourselves to theorize more freely regarding the phenomenon than we care to do at present. As it is, we shall present the experiments, and endeavor to reserve our opinions concerning them for a future day.

It may strike some persons that the present paper is entirely irrelevant to the subject of percolation and precipitation; but if we are permitted to complete this subject, we think that it will be shown that it is intimately connected with certain features that have considerably troubled pharmacists and others.

An unanswered query, once accepted by one of our most prominent members, is directly interested, and the phenomenon presented herein must be considered before that query can be satisfactorily answered.

A process of percolation, suggested once, in which the menstruum was directed to be admitted at the bottom of the percolator, and permitted to escape at the top, is also concerned.

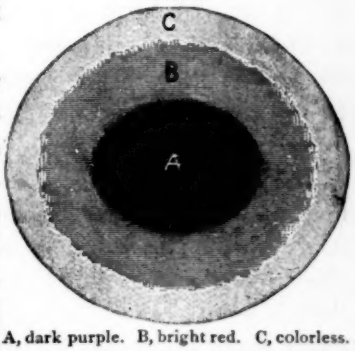
Perhaps the analytical chemist will find some food for consideration, as it does not seem unreasonable to suppose that the principle involved in this paper may be of practical value in the separation of certain bodies one from another. Then, too, it may be found advisable to forego the process of filtration, if possible, where accurate results are desired. However, after we have introduced the line of experiments, and the criticisms into which we have been drawn, these features will readily present themselves to those interested.

Let us now revert to the separation of the two salts by the evaporation of the water. The explanation that naturally presents itself is, that their separation resulted from the fact that the chloride of sodium crystallized, and left a mother liquor of chloride of ammonium. This afterward evaporated; and thus the salts were deposited in different locations. In order to test the correctness of the view, we were led to several series of experiments; and a section of one of these may be illustrated as follows.[1]

[1] We only give enough of the series to demonstrate the one feature to which this paper is devoted. Our investigations have extended far beyond the line drawn by this report, but we do not care to impose upon the society by introducing another step, as it would double the length of the paper.

Take an ordinary porous blotting-paper, and drop into its centre, drop after drop, some writing fluid. The spot will spread, but it will not present the same appearance from the center outward. There is usually a dark center, and then a dark line of demarkation, after which another shade appears, which, after spreading to a certain distance, will perhaps suddenly give place to a nearly colorless liquid. Continue to add the fluid slowly to the center of the blot, and the shades of color will expand and preserve their individuality, but the outer will usually grow more rapidly than the one immediately within. Sometimes several shades will be formed, but their individual characteristics will be maintained. If the ink be one of the purple or other colors of aniline, or a carmine, it will be generally found that the outer liquid will be colorless. The striking feature is the abrupt change from one shade to the other. It is not a gradual grading off, for a distinct line of demarkation usually separates each shade. We have introduced this experiment because it can be so readily performed, and because, upon second thought, every person must even now admit its familiarity. Mix two colors of ink, say red and blue, and try the experiment again. Very likely it will be observed that, under the same conditions, one color will leave the other after both have passed together for a certain distance, and leave it completely, and by a distinct line of demarkation. Then perhaps this second color will cease to spread, and a colorless liquid will pass out, and form a ring encircling the ink spot. (Fig. 1.)

FIG. I.



A, dark purple. B, bright red. C, colorless.

These experiments may be easily made, and will illustrate the phenomenon; but since there are so many kinds of ink, it is impossible to predict a certain result. Therefore, to enter into the subject more systematically, we will bring forward the following experiment, in order to illustrate a natural phenomenon that we have not been able to find recorded in any work, and upon which those we have consulted can furnish us no information:

Dilute one part, by measure, of officinal solution of tersulphate of iron with thirty-two parts of water; then place a strip of blotting-paper, of loose texture, so that the lower end is immersed in the liquid.

A liquid is absorbed, and passes rapidly into the paper, reaching to a height of about half an inch at once. Then it ceases to extend upward as solution of tersulphate of iron, but not as a liquid.[1] A line of demarkation appears as distinct as though drawn by a pencil, and above this line a colorless solution passes; and this liquid is absolutely free from any salt of iron. If a piece of ferrocyanide of potassium be drawn over this paper, it refuses to strike a blue color until the dividing line is struck. Other reagents demonstrate conclusively the absence of even traces of iron above this line. (Fig. 2—for explanation see Fig. 3.) Here we have presented a reaction in which a substance in solution has separated from the solvent, without evaporation of the liquid, apparent precipitation of the solid in insoluble form, or change of solvent power of the liquid.

FIG. II.

In considering this question from the experiment presented, a doubt must arise in our minds regarding the subject. Is it really a separation of a soluble iron salt from a solvent capable of dissolving it? This query naturally occurs when we notice that the upper edge of the iron solution, as it is absorbed by the paper, has a red color, which deepens as it passes upward, until finally the colorless liquid shoots above it. May it not be that an insoluble basic salt of iron is formed by oxidation of the iron, in the very thin layer of liquid? We thus questioned the matter, and found that the line of division formed as readily and the same in an atmosphere of carbonic acid gas. Again, a piece of paper from just beneath the line—indeed, the very edge of the line of division—when dipped into water, formed a solution that gave a deep blue color with solution of ferrocyanide of potassium.

This experiment, then, seemed to show that by means of an agency heretofore unrecognized in this manner, and which seems to be capillary attraction, a separation of solvent from substance dissolved can be effected, and absolutely. In analyzing the phenomenon, we find that there is not a gradual shading off of iron salt from below upward. It might seem natural to view the reaction as an absorption of the iron

[1] The texture of the paper influences the height to which the solution passes before the separation. The line of separation is soonest formed when the paper is porous. Very firm, compact paper will carry the entire solution to a considerable height. Common Swedish filter paper will answer, but not so well as blotting-paper.

by the fibers of the paper through which the liquid passed, until finally all the iron disappeared. Upon the contrary, it seemed to be a struggling upward of several liquids;[1] and when the so-called solution reaches a certain height, one part of it is attracted onward with greater force, and frees itself from the others. There appears to be an unequal attractive force between the fibers of the paper and the substances passing through them; there seems to be an unequal and independent capillary attraction between the fibers not moistened and the liquids in contact with them. These forces acting at the same time, cause a separation of solutions at a certain distance from the surface of the liquid; and after this separation is once effected, the liquid that has freed itself from the other, or others, seems to pass freely through it, or them, apparently drawn from above more rapidly than the other, or others can follow. Thus, although the lower part of the paper is saturated with mixed solutions,[2] the liquid that has separated itself seems to flow rapidly through the lower stratum and out of the line of demarkation, without a molecule of the iron salt accompanying it.[3]

In continuing the study of this phenomenon, we find that the proportion which the iron salt bears to the liquid influences the point at which the separation of the iron solution occurs. If the solution is dilute, the separation takes place just above the surface of the liquid in the vessel. As it increases in strength, the iron passes higher upon the paper, and with officinal syrupy solution of tersulphate of iron there will be no separation. (See Fig. 3.)

This fact leads to another point in connection with the subject, to wit: an attraction seemingly exists between the iron salt and the water, which is stronger in proportion to its concentration. Therefore, as the

[1] Solution of tersulphate of iron contains other substances besides the salt of iron. There are free acids, and they are not retained in accordance with the detention of the iron. The indications are also that the coloration of solution of ferric sulphate is due to accompanying oxide or oxysulphate in soluble form, and that true ferric sulphate has no red color.

[2] We admit that the term solutions is not in accordance with our present understanding of a solution of several salts in one menstruum. Authorities do not, we think, view them as distinct liquids mixed together and existing independently of each other, but rather as one solution. For the sake of illustrating these experiments, we shall speak of a solution of different bodies as being an association of separate solutions, each retaining its individuality.

[3] There is a gradual and uniform upward motion of all the liquids, however, although the lowest stratum in the paper moves slowest.

proportion is in favor of the iron, the water has less power to free itself and climb away.

Can it be, then, that capillary or surface attraction has the power to dissociate a solution? If so, it seems to us that this fact must have been overlooked in many instances where its consideration was a necessity to accuracy in results.

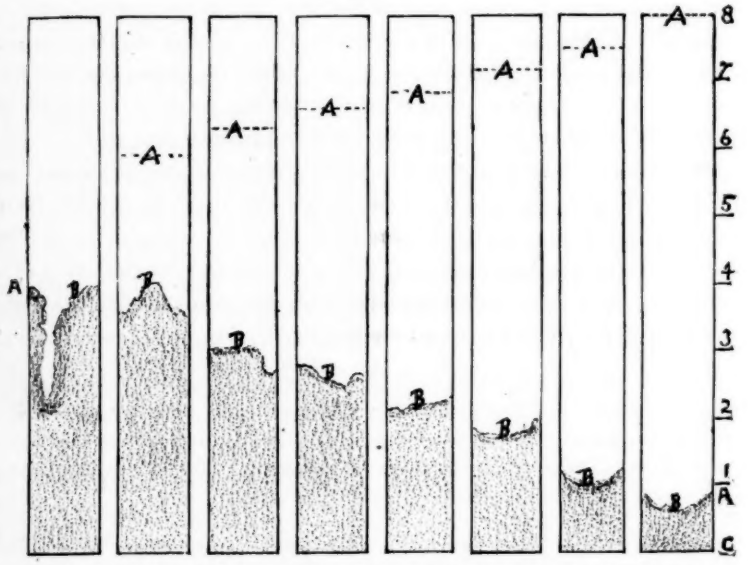
In looking at the phenomenon as presented in the foregoing portion of our paper, it will be seen that we may sum up the matter as follows:

1st. The bibulous paper absorbs and carries to a certain height the liquid about as it exists in the vessel.

2d. At a point above the surface of the liquid, determined by the texture of the paper and the concentration of the solution, the iron salt ceases to pass upward[1] as rapidly as the water or other substances held in solution by the water.

3d. Then the liquids separate, and the colorless liquid is actually

FIG. III.



A, colorless liquid. B, ferric sulphate. C, surface of liquid. The left hand figure is officinal solution of tersulphate of iron.

drawn (or thrust) through the solution of iron without carrying a trace of ferric sulphate beyond the line of division.

[1] We use the term upward to correspond with this line of experiments. The same phenomenon is presented when the paper is horizontal or inclined, if capillary attraction only carries the liquid outward.

In order to determine the amount of water thus passing through a liquid, we call attention to the following experiment:

A piece of blotting paper was placed with the lower end in a solution of ferric sulphate, made by mixing 1 part of officinal solution of tersulphate of iron with 32 parts of water. The separation occurred as previously described, and when the watery liquid reached the top of the paper (5 inches), the iron solution had ascended but 2 inches. The paper was then divided at the line of separation and at the surface of the liquid, the iron solution in the lower part was weighed with the paper, and the water and paper in the upper portion weighed. Each part was then dried, and weighed again.

RESULT.—Water in the part of the paper that contained iron, 7 parts.

Water in the paper above the line to which the iron had ascended, 7½ parts.

In the same way, one part of solution of tersulphate of iron (ferric sulphate) was mixed with sixty-four parts of water, and the portions of paper examined.

RESULT.—Water in the part of the paper that contained iron, 4 parts.

Water above the line to which the iron ascended, 9½ parts.

Thus it will be seen that in the first experiment the water that had separated was slightly greater than that remaining with the iron; while in the second experiment more than twice as much water escaped as remained with the iron.

We present also an experiment with acetate of lead, as follows:

Five grains of acetate of lead were dissolved in one fluidounce of water. The paper was immersed, and the dividing line ascertained by means of a crystal of iodide of potassium. Upon separating the paper, it was found that

The water in the part of paper that contained lead, amounted to 8½ parts.

Water in the paper above the line to which the lead ascended, amounted to 4½ parts.

In the same way, five grains of acetate of lead were dissolved in four fluidounces of water:

The water in the part of the paper that contained lead, amounted to 5½ parts.

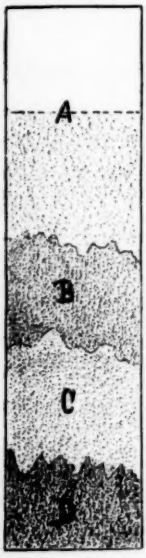
Water in the paper above the line to which the lead ascended, amounted to 13½ parts.

All of these experiments uphold the principle that the weaker the solution the quicker the separation, and the larger the amount of the escaped water.

We have mentioned the fact that mixed colored inks separate from each other under the influence of the capillary attraction of bibulous paper. It is demonstrated that certain salts will also do this, and completely. In order to show that they act independently of each other when dissolved in a single solvent, we call attention to the following experiment:

Dissolve separately, each in one ounce of water, five grains of ferrous sulphate (and add one drop of sulphuric acid), five grains of cupric sulphate, and thirty minims of officinal solution of tersulphate of iron (ferric sulphate). Place a strip of bibulous paper upright in each, and it will be found that at a certain height the metallic solution is retarded. This can be readily shown by drawing a piece of red or yellow prussiate of potash down the paper, for the characteristic coloration will appear as soon as the reagent comes in contact with the salt. However, it will be found that they separate at different heights in the papers.

FIG. IV.



Now mix the solutions, and repeat the paper experiment. When the reagents are applied to the paper, it will be shown that the ferric sulphate extends only a certain distance; then a mixture of ferrous sulphate and cupric sulphate; then the ferrous sulphate alone; and finally a colorless solution passes onward, perfectly free from either salt. (Fig. 4—for explanation see Fig. 5.) The boundary line between each salt is clear and sharp.

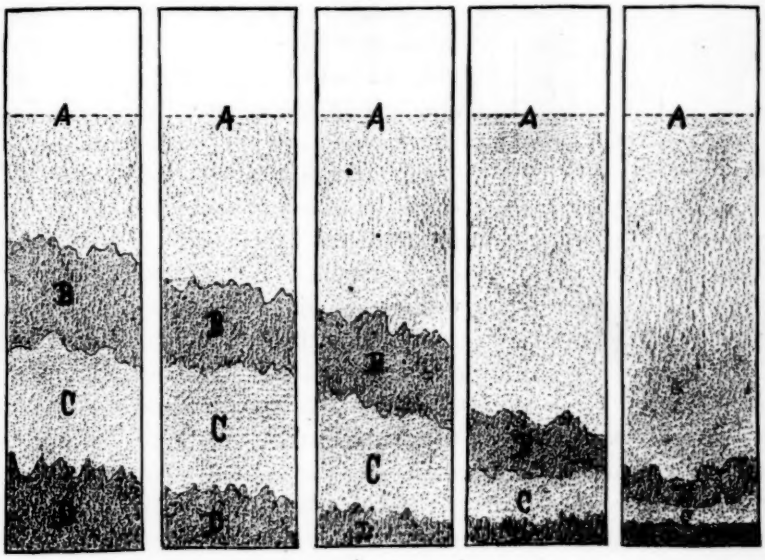
Upon diluting this mixture with its bulk of water, the rule of the diluted ferric sulphate (Fig. 3) is found to be maintained; and, by repeated dilution of each succeeding solution with its bulk of water, a series of regular demarkations are obtained, as shown by Fig. 5.

In the same manner solutions of certain alkaloidal salts can be separated from each other, as, for example, sulphate of quinine and sulphate of berberine, the quinine salt passing onward and leaving the berberine.[1]

[1] It is not unreasonable to suppose that advantage may be taken of this principle to separate certain bodies that seem to dissolve and precipitate alike. Indeed, we have used it in separating uncrystallizable coloring matters from crystals of organic bodies, where simply the close wrapping of two or three layers of blotting paper over the moist magma will remove the coloring material as the mass dries out.

In carrying this series of experiments further, it is readily shown that not only can we separate liquids from each other within the paper, but we can separate them as liquids by acknowledging the fact that a liquid tends to flow from a tube, capillary or otherwise, if the extremity is beneath the surface of the liquid in the container. Two test-tubes were placed beside each other, and into one an inch of solution of ferric sulphate (the strength before named) was poured. A strip of blotting-paper was then so placed that one end reached into the liquid, while the other end rested below it in the other vial. The paper was curved so that the height was four inches; therefore the liquid traversed eight inches. The exposed part of the paper was covered by means of a sheet of rubber, in order to retard evaporation. (See Fig. 6.)

FIG. V.



A, height of colorless liquid. B, height to which the ferrous sulphate is carried. C, height to which the sulphate of copper is carried. D, height to which the ferric sulphate is carried.

In twenty-four hours a layer of colorless liquid was carried into the empty vial, and this liquid refused to show a trace of iron by the usual reagents.

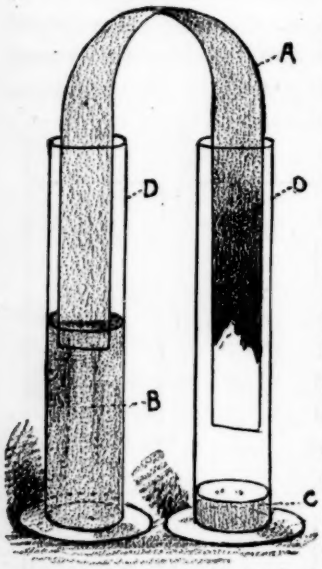
Therefore, to sum up from the view presented by these experiments:

The solvent can be perfectly separated from dissolved matter by what appears to be simply capillary attraction.

We must not, however, infer that this is evidence that such a rule will be carried out with other bodies. Experiments with many salts and other substances agreed, but some refused to separate, chloride of sodium being carried to a height of six feet.

We do not design in this paper to enter into a theoretical argument regarding the causes for the phenomenon herein presented. We aim simply to present the facts, and, in so doing, must consider briefly certain objections that have occurred to us regarding the idea that real solutions can be separated from each other by means of the capillary or surface attraction of materials that have no recognized chemical affinity for either of the constituents. Therefore, as the substances that we have named are all solids, it might perhaps be inferred that the molecules of these solids are held in the minute interstices of the paper, while the more mobile fluid escapes.[1] Such a view could scarcely be sustained, because mixtures of *liquids* may be separated from each other—indeed, even though such a mixture is supposed to have combined chemically. Sulphuric acid and water are accepted as having rather an intense affinity, and their union is broken only by a considerable display of energy. The mixture of sulphuric acid and water is as perfectly disintegrated by the bibulous paper as were the other substances named by us. This can be shown by making a dilute solution of sulphuric acid in water, and allowing it to pass up the paper, and then pressing a piece of blue litmus paper upon the surface of the part of the bibulous paper that is moistened. The litmus will change to red for a certain distance, defined by a line of demarkation as distinct as that shown by the iron salt.

FIG. VI.



A, blotting paper. B, solution ferric sulphate. C, transmitted liquid. D, ferric sulphate in paper.

The facts, then, to be presented in this paper are, that—

1st. Liquids can be separated from solids held in solution, without

[1] It must be admitted that such a view is not in accordance with our idea of a solution.

evaporating the liquid or precipitating the solid in an insoluble condition.

2d. Liquids can be separated from each other.

3d. Certain chemical combinations even can be broken without calling upon such recognized dissociating powers as high or low temperature, or the action of reagents.

This dissociating force has been overlooked in many places where, perhaps, it might have been useful. It may have been an unknown factor in leading to discrepancies in delicate analytical work that involved frequent filtration. There are other points of interest that we hope to consider in the future.

CIMICIFUGA RACEMOSA.

By Milton S. Falck, Ph.G.

From an Inaugural Essay.

Description.—The rhizome is (25 mm.–15 cm.) 1 to 6 inches or more in length, and from (5–25 mm.) $\frac{1}{5}$ to 1 inch in thickness, horizontal, rather hard, after drying brownish-black externally, yellowish-white internally, with stout upright or curved branches. These branches are annulated and slightly wrinkled, and are marked above by cup-shaped scars left by the decay of the overground stems of previous years. Attached to the lower side of the rhizomes are numerous brittle, irregularly rounded, wiry rootlets, about (3 mm.) $\frac{1}{8}$ inch thick, or less, of a blackish-brown color externally, white internally, and longitudinally wrinkled. The drug has a rather heavy disagreeable odor when fresh, but is nearly inodorous when dried. The taste (at first mucilaginous) becomes persistently bitter and acrid. The drug when dry and old has these qualities less evident, which point to the fact that it is less active than when recently dried, or when in a fresh state, and this is fully carried out by the more satisfactory results obtained by the administration of the latter as remedial agents. It should be collected in the latter part of August and early part of September, as at this time of the year the drug is most fully developed. The odor and taste of the rootlets resemble that of the rhizome. As met with in commerce, the rootlets and often the rhizomes are much broken, and quite frequently the former are alltogether wanting.

Histology.—The rhizome breaks with a smooth fracture, and

exhibits upon a transverse section a large central pith made up of about twenty-one rows of colorless, thin-walled, parenchymatous cells. Surrounding this central cell-structure is a circle of wood-tissue, about as wide as the pith, consisting of flattened prosenchymatous cells smaller than the cells of the pith and circurlarly arranged in more or less distinctly wedge-shaped masses, and, of large thicker walled cells, which upon examining a longitudinal section proved to be pitted ducts. The woody-tissue has about thirty to forty medullary rays radiating through it from the pith to the bark. These rays are made up of ten to twelve rows of elongated parenchymatous cells and two to three rows of pitted ducts. The pleurenchymatous tissue is separated from the prosenchymatous tissue of the bark by a cambium layer made up of a single row of rectangular-shaped cells about one-fourth the size of the surrounding cell-structure. The bark is made up of two layers. The outer bark consists of three to five rows of loose thin walled parenchyma, containing a yellowish-brown coloring matter. The inner bark consists of about thirty rows of horizontally flattened prosenchymatous cells larger than the cells of the woody tissue or pith.

The rootlets have a short, smooth fracture; and upon a transverse section show an outer and inner bark, a cambium layer, and a meditullium. The outer bark consists of one to two rows of parenchymatous cells loosely placed together containing a brownish coloring matter. The inner bark consists of ten to twelve circular rows of flattened prosenchymatous cells. The bark is separated from the meditullium by a cambium layer of a single line of rectangular cells smaller than the surrounding tissues. The meditullium is made up of complete parenchymatous cells, with lighter colored rectangular pleurenchyma tissue radiating through it in a triangular, cross-like or stellate manner according to the number of wood-bundles. Around the outer sides of the meditullium and at the ends of the wood-rays the parenchyma tissue is crowded in dense masses and elongated, as if pushed out of place by the wood-bundles. The arrangement of the woody tissue in the rootlets, representing a maltese cross, is the characteristic distinguishing mark of the drug.

Medical History.—The early history of this drug, and the time when it was first used as a remedial agent to the human race is not known. Considerable variance of opinion has existed with regard to the influence this drug is capable of exciting upon the animal economy.

Linnæus, in his *Materia Medica* published in 1771, called it *Actæa*

racemosa, and classed it among the sudorifics and anodynes. The first mention of the drug by the profession was made by Benjamin Smith Barton in his *Collections for an Essay towards a Materia Medica of the United States*, in which he says: "The *Actæa racemosa* or Black Snakeroot, is also a valuable medicine. The root of the plant is considered astringent. In a putrid sore-throat which prevailed in Jersey, many years ago, a strong decoction of the root was used as a gargle with great success. The Indians called it squaw-root, and set an high value on it as a medicine. A decoction cures the itch."

The author then notes from various journals and standard works the observations and recommendations by Drs. Garden, of Wyliesburg, Va., (1823), C. C. Hildreth, Chapman (1831), Jesse Young, Davis, Physicks, Wood and many others, and afterward discusses the introduction of the drug into the United States Pharmacopœia and the various preparations made from it since 1860.

Chemical Analysis.—Two portions, 5 grams each of the fresh rhizome and rootlets were dried: one spontaneously, the other in a desiccator. That portion dried spontaneously lost 52·5 per cent., that in the desiccator 54·5 per cent. of moisture. One gram of the powdered air-dried drug at 100° C. lost 7·8 per cent. of moisture. This upon being incinerated at a low heat, yielded 6·8 per cent. of a grayish-white ash; of this ash, 1·3 per cent. was soluble in water, consisting of potassium and sodium as chlorides and sulphates; 3·6 per cent. soluble in hydrochloric acid, consisting of calcium, iron, and magnesium as carbonates and phosphates; 4 per cent. soluble in sodium hydrate, consisting of combined silica, and 1·5 was insoluble in water, hydrochloric acid and sodium hydrate.

An infusion of the drug upon evaporating and cooling became slightly gelatinous. The infusion yielded, precipitates with nitric acid, copper sulphate, lead acetate, silver nitrate, mercuric chloide, ammonium moxalate and gelatia; it became blue with iodine and reduced Trommer's solution.

The percolate, made with cold water, was of a yellowish-brown color, at first clear, soon became cloudy and upon evaporating yielded 23·5 per cent. of a brownish-black extract. The alcoholic percolate was of a clear golden yellow color, and upon evaporating yielded 12·5 per cent. of uniform yellowish-brown extract.

Wax was found in small quantities, by treating the resin exhausted by alcohol, with chloroform. Resin was obtained by exhausting the

drug with alcohol, evaporating and pouring the concentrated tincture into water, collecting the precipitate washing and drying. The resin had a brownish-yellow color, was without odor, but had a slight taste, was soluble in alcohol, ether and chloroform, partly soluble in cold and hot solutions of potassa, and insoluble in benzin, hot and cold water. After treatment with animal charcoal the resin was of a yellowish-green color, and when incinerated left a grayish-white ash.

The distillate obtained by cohobation from 26 pounds of the fresh drug, was milky and had the odor of the drug, but no separation of volatile oil occurred, though the top of the bottle which contained the distillate, appeared greasy when the water was shaken. Portions of this distillate were then agitated with ether, chloroform and deodorized benzin, and set aside. After twenty-four hours that agitated with benzin had a whitish snow-like substance floating upon the top, while that which had been agitated with chloroform had separated the substance at the bottom of the vessel, and no similar separation was observed in the portion of the distillate agitated with ether.

The floating mass, collected from the distillate agitated with benzin, appeared like minute globules, and after freeing it as much as possible from benzin and water, and evaporating it to dryness, the residue weighed ·025 grams and was a fine grayish-white powder without odor or taste, soluble in alcohol, slightly soluble in benzin, benzol and stronger ether, insoluble in water.

Ten pounds (avoir.) of the fresh drug was placed in an hydraulic press (power 4,000 pounds to the square inch). From this pressure there resulted one pint and a half of dirty-brown colored liquid, which after filtering was blackish-brown, and on evaporating yielded 4·252 grams of brownish-black extract. Treated in the manner stated by T. E. Conard, "Am. Jour. Phar., 1871, p. 152," the crystalline substance described by him, was obtained, the properties of which differed in the following particulars: It was insoluble in hydrochloric acid, but soluble in sulphuric and dilute sulphuric acids. Strong sulphuric acid, when in contact with it for a little time, gave it a brown color, which upon the addition of a few drops of solution of bichromate of potassium was changed to a permanent yellow. An alcoholic solution was neutral, or if anything slightly alkaline to test paper, and when concentrated and poured into water gave a white precipitate which was insoluble in the alkalies. The fumes from the substance when fused with pure potassa, in a test tube, colored red litmus-paper

blue, and gave rise to white fumes when a rod moistened with hydrochloric acid was passed partly into and over the top of the tube. The substance fuses at a moderate heat, and is entirely dissipated at a red heat. A precipitate was obtained when a solution of the substance in alcohol was treated with an alcoholic solution of chloride of gold and sodium, also when an acid solution was treated with an aqueous solution of chloride of gold and sodium. An acid solution when treated with phosphomolybidic acid gave a precipitate. An acid solution (the acid solutions all made with dilute sulphuric acid) gave with solution of iodo-hydrargyrate of potassium a precipitate. A precipitate was gotten from an alcoholic solution by adding an aqueous solution of tannin, care must be taken not to add sufficient to get a precipitate with water in the test solution. From the above tests and the examination with the microscope which I have made of this substance, isolated from cimicifuga racemosa, I judge it to be an alkaloid.

SANICULA MARILANDICA, LINNÉ.

By Calvin Jerome Houck, Ph.G.

From an Inaugural Essay.

This species, which is known in the neighborhood of Lebanon, Pa., by the name of Black Sanicle Root, or Pool Root, is a perennial plant growing to the height of about two feet. The stem is slender, finely grooved, and dichotomously branched above. The stem-leaves are 5–7 parted, the divisions ranging in shape from obovate to lanceolate, and being doubly serrate. The flowers (some of which are sterile) are arranged in nearly simple umbels. The fertile flowers are sessile, and produce a round orthospermous cremocarp which is covered with prickles. The plant grows in abundance in the interior of Pennsylvania, in shady and rocky woods, and flowers in June or July. The root which is the part employed, is short and thick, with many rootlets, has a slight odor when fresh, which becomes more persistent by long keeping, and is light brown in color, but becomes black after drying. It is collected during the month of August, and loses one-fourth (?) of its weight by drying. When boiled the bark is detached exposing the thin white inner root. The root when chewed is strongly

acrid, and pungent, and quite aromatic, but leaves a very unpleasant sickening sensation on the tongue and pauces, remaining for a long time. It is an expectorant, diaphoretic; sometimes used in intermittent fever, also in chorea. In the interior of Pennsylvania, it is extensively used in domestic practice for pulmonary affections, with satisfactory results.

Owing to the oily nature of the root, an etherial extract was first prepared from four ounces of the root in fine powder by exhausting it with ether; the extract was oily, resinous, very aromatic, dark in color, with a burning acrid, and nauseous taste, insoluble in water, partly soluble in alcohol and chloroform. A portion of this extract dissolved in an alkaline solution, was precipitated by the addition of a small quantity of acid; upon drying this precipitate and subjecting it to a flame it burns emitting dense smoke.

Four ounces of the root in No. 40 powder, exhausted with dilute alcohol, yielded a soft extract weighing 2½ drachms; only slightly pungent, not very aromatic, but dark in color, containing only a slight trace of oil and no resin, but considerable coloring matter.

Eight ounces of the powdered root in (No. 50 powder) were exhausted, first with ether, then with alcohol, and lastly with dilute alcohol. The etherial tincture had scarcely any color, but contained considerable oil and resin. The alcoholic tincture was of a pale straw color, and contained resin and extractive. The dilute alcoholic tincture was dark brown in color and contained tannin, extractive and coloring matters. These tinctures being evaporated to extracts and testing as before, gave results similar to those mentioned before.

The four ounces of root which had been exhausted by dilute alcohol alone, were boiled with water, giving a decoction which was dark brown in color, with but slight odor. By testing it was found to contain gum, starch, coloring matter and extractive.

One ounce of the root was carefully reduced to ashes, weighing 43 grains, and containing phosphate and carbonate of potassium, calcium, magnesium and iron.

The virtues of the root probably depend mainly on the volatile oil and resin; the alcoholic tincture seems to contain all the desirable constituents in solution.

ANALYSIS OF MALT.

By Frank X. Moerk, Ph.G.

From an Inaugural Essay.[1]

The malt used in this analysis was prepared from the barley of the previous analysis, and was eight days on the floor. It was reduced to a fine powder by grinding and using a mortar and pestle. The analysis, with the exception of the alcohol extract, was a repetition of the same operations described for barley (see "Amer. Jour. Phar.," 1884, p. 366).

Moisture.—Loss in drying 5 Gm., 0·528 Gm., or 10·56 per cent.

Ash.—Amount of ash in 5 Gm., 0·119 Gm., or 2·38 per cent. Of the 0·119 Gm., 0·046 Gm. was soluble in water, 0·045 Gm. in hydrochloric acid, 0·015 Gm. in solution of soda, and 0·013 Gm. was insoluble.

Nitrogen Estimation.—2 Gm. of malt evolved sufficient ammonia to replace 135·1 Cc. of the alkaline solution, or to neutralize 2·702 Cc. of the acid solution. By multiplying 2·702 by 0·014 Gm., for reasons already given, there is obtained 0·037828 Gm. nitrogen, and this product multiplied by 6·25 gives 0·23645 Gm., the amount of proteids in 2 Gm. malt, or 11·82 per cent.

Benzin Extract.—10 Gm. of powdered malt were treated with benzin until exhausted. The total extract amounted to 0·34 Gm. Of this, 0·026 Gm. was soluble in water (fatty and acid); 0·17 Gm. was soluble in alcohol (fatty and resinous); and 0·144 Gm. was insoluble in water or alcohol.

Alcohol Extract, No. I.—After drying the portion insoluble in benzin it was exhausted with 80 per cent. alcohol. The total extract was 1·533 Gm., of which about 0·22 Gm. consisted of a light brownish mass, soluble in water and alkalies; the solution of the substance in the latter was considerably darker in color. This darkening is also produced by long heating of the aqueous solution. The extract was carefully neutralized with an alcoholic solution of sodium hydrate, and evaporated to dryness on a water-bath. It was then extracted with boiling water, and diluted to 75 Cc. This solution reduced Fehling's

[1] The essay was accompanied by a number of samples of the different products obtained in the course of investigation.

solution. As the extract was made without heat, and neutralized before evaporating, the sugar detected could not have been produced from cane-sugar or dextrin.

O'Sullivan, about 12 years ago, rediscovered the fact that solutions of malt or diastase, in acting upon gelatinized starch, do not produce glucose, as was previously believed, but maltose, an isomer of cane-sugar. Maltose was first obtained by De Saussure, in 1819, but Dubrunfaut, in 1847, was the first one to recognize it as a distinct sugar. The sugar found in the above extract was regarded as maltose. This sugar has a reducing power two-thirds as large as that of glucose, thus requiring 0·075 Gm. to reduce 10 Cc. Fehling's solution. The amount found in the extract was 0·67 Gm.

After estimating the maltose, the remaining 50 Cc. of the solution were mixed with 3 Cc. hydrochloric acid and boiled for 2 hours. The acid was then neutralized and the liquid reduced to 75 Cc. The whole extract was capable of reducing 6·38 Gm. HgI_2, and Fehling's solution showed the presence of 1·2671 Gm. sugar.

In this case the following equations are gotten; $x + y = 1{\cdot}2671$ and $4{\cdot}79\,x + 6{\cdot}71\,y = 6{\cdot}38$, showing, when calculated, that 0·162 Gm. invert-sugar, produced from 0·154 Gm. cane-sugar, and 1·105 Gm. glucose were contained in the extract after boiling with the acid. The maltose—0·67 Gm.—on boiling with acids is rapidly converted into glucose, and, as it is an isomer of cane-sugar, the change is effected in the same way: $342 : 0{\cdot}67 :: 360 : x = 0{\cdot}705$ Gm. glucose produced from the maltose. This amount of glucose subtracted from 1·105 Gm. yields 0·4 Gm., which must have been produced from 0·36 Gm. dextrin.

No. II.—To ascertain if the sugars and dextrin were originally present in such a large proportion, or if they were formed during maceration, another alcohol—95 per cent.—extract was made from 20 Gm. malt after the fat, etc., had been removed by benzin. This extract was treated as the previous one, with the sole exception of diluting to 75 Cc. instead of 150 Cc. This solution tested for maltose showed the presence of only 0·304 Gm. The remainder of the solution, after boiling with acid and neutralizing, was again tested. The whole extract contained 0·6446 Gm. sugar, and reduced 3·71 Gm. HgI_2.

$x + y = 0{\cdot}6446$ and $4{\cdot}79\,x + 6{\cdot}71\,y = 3{\cdot}71$. When these equations are calculated, x or glucose equals 0·3204 Gm. and y or invert-

sugar equals 0·3241 Gm. The 0·3204 Gm. glucose is produced from 0·304 Gm. maltose, and the 0·3241 Gm. invert-sugar from 0·308 Gm. cane-sugar.

No. III.—There being such a large difference in the amount of maltose in the two extracts, another extract was made from 20 Gm. malt, with dilute alcohol containing 2 per cent. salicylic acid. This acid was used successfully by Brown and Heron to arrest the action of diastase. This extract was made by macerating the malt with three successive portions of the menstruum of 50 Cc. each. Alcohol was added after the last percolate to remove all of the salicylic acid. The percolate was neutralized with potassium hydrate, evaporated to dryness, and the residue extracted with hot water and diluted to make 75 Cc.

When tested for maltose, the same quantity was found as in No. II —0·304 Gm. The remainder of the solution, treated with acid as in No. II, showed the presence of 0·9485 Gm. sugar in the whole quantity, while it reduced 5·165 Gm. HgI_2. The sugar, 0·9485 Gm., consisted of 0·324 Gm. invert-sugar from 0·308 Gm. cane-sugar, and 0·6246 Gm. glucose. Of this, 0·32 Gm. glucose was produced from 0·304 Gm. maltose, leaving 0·3046 Gm. glucose produced from 0·274 Gm. dextrin.

The results of the extracts are summed up as follows:

	Cane-sugar.	Maltose.	Dextrin.
No. I	1·54 per cent.	6·7 per cent.	.....
No. II	1·54 "	1·52 "	.....
No. III	1·54 "	1·52 "	1·37 per cent.

Cold Water Extract.—To make this extract, the undissolved portion remaining from the last alcoholic extract was taken and macerated, and percolated with water until the percolate ceased to leave a residue on evaporation. The percolate was concentrated to 40 Cc. and tested for sugar, but this was shown to be absent.

After boiling it with dilute sulphuric acid for two hours, neutralizing with sodium aarbonate, and again testing for sugar, glucose was present to the extent of 0·4754 Gm., reducing 2·2804 Gm. HgI_2, formed from 0·428 Gm. dextrin.

The insoluble parts of the malt were dried, and weighed 14·932 Gm. —from 20 Gm. malt.

Acid Extract.—These 14·932 Gm. were boiled with 10 Cc. sulphu-

ric acid and 400 Cc. water for 8 hours. It was then proceeded with as the acid extract under barley. The amount of sugar found was 12·346 Gm., and consisted only of glucose, reducing 59·221 Gm. HgI_2. This glucose was produced from 11·112 Gm. starch. The insoluble portion weighed 3·58 Gm. and the extract 11·352 Gm., of which 0·24 Gm. was not starch.

Alkali Extract.—The remnants of the malt, 3·58 Gm., were boiled with 200 Cc. of a 20 per cent. solution of sodium hydrate, filtered and washed thoroughly. The insoluble parts when dried weighed 1·596 Gm. The extract, weighing 1·984 Gm., consisted of proteids and ash.

The crude cellulose and ash, 1·596 Gm., was macerated for 24 hours in a solution of chlorinated soda, then thoroughly washed and dried. Weight, 1·59 Gm.

The amount of ash was found to be 0·046 Gm., leaving 1·544 Gm. as the amount of pure cellulose in 20 Gm. malt.

To sum up the results of the different operations, the results from the alcoholic extract to the pure cellulose were divided by 2, so as to represent 10 Gm. of malt.

The following is the percentage composition:

		Calculated as free from moisture.
Moisture	10·56	.....
Ash	2·38	2·66
Proteids	11·82	13·21
Fat, Resin, etc	5·60	6·26
Cane-sugar	1·54	1·72
Maltose	1·52	1·70
Dextrin	3·51	3·92
Starch	55·56	62·12
Cellulose	7·72	8·63

Examination of Samples.—These samples were prepared for the object of finding out the increase of diastase at certain stages of the malting process.

After numerous experiments on the action of diastase upon gelatinized starch, the idea had to be abandoned for the reason that diastase, no matter how carefully prepared, could not compare in its action on

gelatinized starch with the equivalent amount of malt, and therefore no basis for working could be made. The object was then changed to estimating the amount of maltose and dextrin present in the wort prepared from them.

The samples, of which there were twelve prepared from the same barley, were obtained as follows: One from the barley, one from the steep, one from the couch, one for every twenty-four hours the grain was on the floor, and, lastly, the kiln-dried or finished malt. Of these, the barley and the malt were used in the analysis.

The moisture was determined by drying 5 Gm. until of a constant weight at a temperature of 110°C., or 230°F. Draff constitutes the insoluble portion, and is estimated by collecting on a weighed filter, and drying at 230°F.

Maltose.—20 Gm. of the sample were ground and mixed with 100 Cc. water, at 60°F., and gradually heated in one-half hour to 140°F. It was allowed to remain at this temperature for one-half hour, and then in 15 minutes raised to 167°F., and kept there for another half hour. At the end of this time it was slowly heated to the boiling point, the whole process requiring two hours. The wort, as this is called, was allowed to cool, filtered, and sufficient water passed through the filter to make the filtrate weigh 200 Gm. The *specific gravity* of this was taken at 60°F. The amount of maltose in the solution having been approximately estimated, a portion of the wort is diluted so as to contain about 1 per cent. maltose, and the amount estimated in the whole solution. It has been shown that solutions of maltose or glucose containing less than ½ per cent. or more than 1½ per cent. do not reduce Fehling's solution in the same proportion as solutions containing amounts between the above.

Dextrin is estimated by boiling 25 Gm. of the wort with 75 Gm. water and 3 Cc. sulphuric acid for 2 hours. The amount of glucose found in this portion multiplied by 8 gives the amount of glucose producible from the wort. From this must be subtracted the amount formed from the maltose, giving as the difference the quantity produced from dextrin, which multiplied by ·9 equals the amount of dextrin. This is slightly inaccurate, as no allowance was made for the amount of invert-sugar produced from the cane-sugar, 1 to 1½ per cent.

The result from barley is wanting, as the wort was so mucilaginous that it could not be filtered.

Sample.	Specific Gravity.	Moisture, per cent.	Draff, per cent.	Maltose, per cent.	Dextrin, per cent.
Barley					
Steep	1·0206	11·34	39·650	22·065	15·560
Couch	1·0213	11·65	38·100	23·570	15·900
1 day on floor	1·0223	11·16	37·700	25·155	16·495
2 days on floor	1·0231	10·96	37·050	27·795	15·570
3 " "	1·0241	10·38	36·500	30·910	14·330
4 " "	1·0247	10·60	33·650	36·190	11·155
5 " "	1·0250	10·16	32·250	40·785	8·565
6 " "	1·0257	10·52	28·500	41·675	10·510
7 " "	1·0260	10·20	27·985	42·535	12·380
8 " "	1·0264	10·26	26·215	43·535	14·965
Kiln-dried	1·0271	10·56	25·900	44·885	13·575

SOLUTION OF SUBACETATE OF LEAD AS A TEST FOR OLIVE OIL.

By S. S. Bradford, Ph.G.

When cotton seed oil is mixed with solution of subacetate of lead a peculiar red color is always produced. In the October number of this Journal, 1882, I called attention to this peculiar color action and gave it as a test for the detection of this oil when mixed with olive oil as an adulterant. The red color produced by the solution is, I am fully convinced, peculiar to this oil, as I have been unable after experimenting with the different seed and animal oils for over ten years to obtain it from any other. This alone would cause it to be a valuable test, but not only cotton seed but any other oil can easily be detected by its use.

Solution of subacetate of lead possesses the peculiar property of saponifying at once when shaken in the cold with pure olive oil. Now if the sample tested contains any cotton seed, or other oil, saponification will not take place no matter how long it is allowed to stand, or how well it may be shaken ; if there is any cotton seed oil in the sample the red color will always be produced.

The want of a reliable test for olive oil has long been felt, and I offer this one after a series of experiments with all the different oils covering a period of over ten years, fully convinced that in this test we have one that can safely be relied on.

Charlestown, Mass., July, 1884.

ACETATE OF MAGNESIUM.

By A. F. W. Neynaber, Sr.

This preparation has not been brought as fully to the notice of physicians and pharmacists as it undoubtedly deserves. It possesses qualities which entitle it to a better consideration. Acetate of magnesium is very soluble in alcohol as well as in water, so much so that this quality has been spoken of as an objection to its general use, whereas, if we look at it in the proper light, this is one of its great advantages, since it enables us to use it with elixirs, wines, syrups, tinctures, fluid extracts, etc. For all these preparations it can be combined with some pleasant aromatics, with laxatives, such as rhubarb, mandrake, leptandra, etc., in neutral solutions as well as with an excess of acid, such as citric acid, tartaric acid, etc. It acts as a purgative, and if combined with rhubarb, jalap, mandrake, leptandra, buckthorn, senna or other laxatives or cathartics and purgatives a very valuable composition is formed. To illustrate its usefulness and to show in which way it may be dispensed several formulas are given below, yielding preparations which are stable and can be kept any length of time without undergoing any change, while all preparations containing citrate of magnesium have the great disadvantage of not being stable.

It is a well known fact that many of the preparations in the market sold as liquid citrate of magnesia, citrate of magnesia granules, etc., containing a very small percentage of the citrate of magnesium, while the bulk is made up of tartrate of sodium, citrate of sodium, etc., because the pure citrate of magnesium is apt to undergo changes which render the preparation insoluble and unsalable.

If we use an exact quantity of calcined magnesia in making the acetate, and then evaporate to a given weight, we can make exact calculations of the strength of the liquid.

In the following are given some practical formulas for the combination of acetate of magnesium with other laxatives, cathartics, etc.

Tincture of Rhubarb and Magnesia.—Calcined magnesia, 2 ounces; acetic acid, a sufficient quantity. Evaporate to 5 fluidounces and 5 fluidrachms. Add ext. rhubarb, 2 fluidounces; fluid ext. cardamom 3 fluidrachms; alcohol, 8 fluidounces. Mix = 1 pint.

Elixir Cathartic.—Calcined magnesia, 240 grains; acetic acid, a sufficient quantity; fluid extract of Culner's root, ½ fluidounce; fluid ex-

tract of butternut bark, ½ fluidounce; fluid extract of Alexandria senna, 2 fluidounces; flavor, a sufficient quantity; simple syrup, 4 fluidounces; deodorized alcohol, 4 fluidounces; citric acid, 40 to 60 grains; water, sufficient to make 1 pint.

Elixir laxans (Laxative Elixir, mild).—Calcined magnesia, 120 grains; acetic acid, a sufficient quantity; fluid extract of Alexandria senna, 2 fluidounces; fluid extract of coriander, 2 fluidrachms; deodorized alcohol, 1 fluidounces; simple syrup, 4 fluidounces; citric acid, 30 to 60 grains; water, sufficient to make 1 pint.

Elixir of Rhubarb and Magnesia.—Rhubarb, 10 grains; magnesia, 5 grains to the tablespoonful dose.

Calcined magnesia, 1,280 grains; acetic acid, a sufficient quantity; fluid extract of rhubarb, 5 fluidounces and 2⅔ fluidrachms; deodorized alcohol, 2 pints; simple syrup, 2 pints; flavor to suit taste; water sufficient to make 1 gallon.

If desired, citric acid can be added, say about 30 to 60 grains, according to taste.

The U. S. Pharmacopœia of 1880 has the following modified formula for *Liquid Citrate of Magnesium*, using carbonate in place of calcined magnesia as required by the U. S. Pharmacopœia of 1860:

Carbonate of magnesia, 200 grains; citric acid, 400 grains; syrup of citric acid, 1,200 grains; bicarbonate of potassium, 30 grains; water, a sufficient quantity to fill a bottle of about 16 fluidounces.

To replace this by acetate of magnesium, I would propose the following formula:

Solution of Acetate of Magnesium.—Carbonate of magnesium, 200 grains; acetate acid, sufficient quantity to neutralize; syrup of citric acid, 1,200 grains; bicarbonate of potassium, 30 grains; water enough to fill a bottle of about 16 fluidounces.

Liquor Magnesiæ Citratis (U. S. Pharmacopœia, 1860).—Magnesia (calcined), 120 grains; citric acid, 450 grains; syrup of citric acid, 2 fluid ounces; bicarbonate of potassa, 40 grains.

To replace this by acetate of magnesium the following formula might be used:

Liquor Magnesii Acetatis, or Solution of Acetate of Magnesium (Magnesia).—Calcined magnesia, 126 grains; acetic acid, sufficient quantity to saturate; syrup of citric acid, 2 fluidounces; bicarbonate of potassa, 40 grains.

Detroit, Michigan.

OBSERVATIONS ON SYDENHAM'S LAUDANUM.

By Eg. Daenen, Pharmacien in Brussels.

Reprint, communicated by the Author.

The results of my observations on Sydenham's laudanum, published in 1872 in the "Jour. de Phar. d'Anvers.," showed, 1, that the tannin of the cinnamon and cloves precipitates a portion of the opium alkaloids; 2, that Chinese cinnamon and cassia lignea are richer in tannin than Ceylon cinnamon; 3, that if cinnamon be used for this laudanum, Ceylon cinnamon should be carefully selected; 4, that in replacing the cinnamon and cloves by their volatile oils, the laudanum thus prepared has all the essential properties of that medicine without the inconveniencies produced by the ingredients named; 5, that the employment of assayed opium or extract of opium is indispensable in order to have in all pharmacies the preparation of as nearly uniform strength as possible.

The observations reported in the present paper give further confirmation to the above conclusions, and moreover demonstrate that time and light do not exert the destructive action upon the product prepared with the volatile oils, that it does upon the officinal laudanum (Vinum Opii).

Four vials were filled with 1, Sydenham's laudanum prepared according to the (Belgian) pharmacopœia; 2, the same, prepared with Chinese, in the place of Ceylon cinnamon; 3, the same, prepared with the oils of cinnamon and cloves; and 4, with Malaga wine. These vials were sealed by Professor Gille and after more than four years were reexamined with the following results: No. 1 was of a dingy brown and contained much precipitate; No. 2 was more of gray color and a larger amount of precipitate; No. 3 had retained its original color and contained only a slight precipitate; No. 4 had also preserved its color and contained a precipitate similar to that in No. 3.

The importance of the subject justifies a repetition in stating that a wine of cinnamon or of cloves, on being added to a vinous tincture of opium or of extract of opium produces at once a turbidity and abundant precipitate, and filtration does not completely prevent the reappearance of a precipitate; Sydenham's laudanum shows a similar behavior. But a wine of saffron or vinous solutions of oil of cinnamon or of cloves, added to a vinous solution of opium or of extract of opium,

produce no apparent disturbance, cause no precipitate, and yield mixtures which remain unaltered, practically, for an indefinite period.

The preparation of Sydenham's Laudanum has been the subject of numerous investigations; many regard it as a pharmaceutical preparation leaving much to desire, and all agree that the precipitate forming therein contains a portion of the opium alkaloids. For further investigation in this direction, 9 Gm. each of Ceylon cinnamon and of cloves were exhausted with sufficient Malaga wine to obtain 600 Gm. of liquid; and 67 Gm. of extract of opium were dissolved in sufficient Malaga wine to obtain 400 Gm. of liquid. Both liquids were perfectly transparent, but on being mixed, became at once strongly turbid. On passing it now through a filter, weighing 25 Gm., the weight of the latter was increased to 58 Gm., or 33 Gm. of dry matter were precipitated from the laudanum. The precipitate was diffused in water, acidulated with acetic acid, and the mixture heated and filtered; the filtrate was dark colored and yielded a precipitate with ammonia. After repeating this operation three times, the precipitate was collected upon a filter washed with distilled water and dried; it weighed 0·15 Gm. and gave all the characteristic reactions of morphine.

It is shown from these experiments 1, that cinnamon as well as cloves, causes in solutions of opium a precipitate containing a portion of the alkaloids, and 2, that the oils of cinnamon and of cloves do not produce such precipitates.

In proposing a modification in the preparation of a medicine which has been used for more than two centuries, it is not sufficient to show pharmaceutical incompatibility, but it should also be considered whether the change would not likewise alter the therapeutic action.

In opium preparations we generally endeavor to modify the narcotic action by associating it with various ingredients as correctives. These ingredients present two particularities, either by acting upon the opium itself, modifying its chemical nature and changing its action and the nature of the impression produced, as is the case with Rousseau's laudanum (by fermentation); or without changing its constitution, by acting with it and directing its influence. The former seem to diminish the stupefying action of opium, while the latter yield mixtures having narcotic and stimulating properties. Cinnamon and cloves are stimulants used in connection with opium; if deprived of tannin, their effect is a useful modification of the stupefying action of poppy juice.

The modification proposed by me follows from the foregoing and

consists in substituting 20 drops each of the oils of cinnamon and of cloves, for 9 Grams of cinnamon and of cloves, directed for 1,000 parts of the laudanum. Thereby the active principles of the medicament are preserved, the loss of a notable portion of the product during the process of preparation is avoided, and the composition is not sensibly altered on keeping, since scarcely any precipitate is formed.

For a long time I have prepared Sydenham's laudanum in this manner, and physicians, who have used it, have found it satisfactory. The new French Codex has replaced Malaga by Grenache wine in making this preparation; but all wines being more or less variable, a greater uniformity with the preparation in question would be attained, if, in place of wine, alcohol of a certain strength was directed.

CHEMICAL AND PHARMACOGNOSTICAL NOTES.

Euphorbia pilulifera.—Dr. C. C. Baker, of New Mexico, reports in the "Therapeutic Gazette," for January, 1884, his use of this plant in two cases of asthma. The results in both were very prompt and satisfactory. This tropical weed has been long used in aphthæ and as an alterative. As far as may be judged from the sensible properties, the virtues of the plant are probably not superior to those of the closely allied indigenous weeds Euph. maculata and hypericifolia. A western species, Euph. humistrata, *Engelmann*, appears to be in popular use in some localities as a remedy for bowel complaints.

Hazigne.—In the "Journal de Pharmacie" for June (p. 456) Professor H. Baillon describes a Malagasy plant called "hazigne," the fruits of which yield an oil, and the stem a resin, which are used by the natives as a remedy in certain skin diseases, such as leprosy, the itch and ulcers. The oil obtained from the seeds is also used as food and for lamps. The hazigne is a handsome tree belonging to the Guttiferæ, and is named *Symphonia fasciculata*. The fruit is known to the natives by the name of "voa-sou-vouara." Some of the seeds are now being submitted to chemical analysis by Messrs. N. J. Regnaud and Villejean.—*Phar. Jour. and Trans.*, June, p. 1048.

Phaseolus limatus, Lin.—In the "Practitioner" (p. 435) it is pointed out that the *Pois d'Achery*, a sort of kidney bean (*Phaseolus limatus*, L.), cultivated in the Mauritius and used there as an occasional article of diet by the Creoles, exists in the form of two varieties; the

one white, which is generally esteemed wholesome, and the other very prettily variegated, which is regarded as poisonous. The poisonous character of the latter is due, according to Drs. Davidson and Stevenson, to hydrocyanic acid, which is formed when the beans are macerated in water by a similar process to that by which it is produced in certain plants of the Rosaceæ, such as the almond and cherry laurel. The reason why two varieties of a plant which cannot be distinguished from each other by any definite botanical characters should produce different chemical compounds is a most interesting problem, and seems to deserve further investigation.—*Ibid.*

Croton morifolius.—A Mexican plant, by name "palillo," has recently been the subject of experiment in France, by Messrs. Dugees and Armendaris ("Bull. Soc. Bot.," [2], v., p. 233). Two or three drops of the oil contained in the seeds act like a moderate dose of castor oil. The natives of Mexico use the leaves of the plant in the form of infusion as a remedy for gastralgia and atony of stomach. The tincture of the leaves is said by the above-named experimentalists to give excellent results in neuralgia, especially when occurring in the face, either when used as liniment, or dropped into the ears, or taken in the dose of 10 or 15 drops in orange-flower water.—*Ibid.*

Sizygium jambolanum is an East Indian plant belonging to the natural order Myrtaceæ, the fruit of which has recently been somewhat in demand on the Continent for use in the treatment of diabetes. M. Banatrala ("Répertoire de Pharmacie," p. 169) has found, in three cases in which he has tried it, that its use led to a diminution in the amount of urine secreted, and that it caused the disappearance of the sugar. These results were manifested in forty-eight hours after taking the medicine. During the time that the patients were submitted to the action of the drug they could take amylaceous food with impunity. The astringent rind of the fruit appears to be the active part.

Borneol from Camphor.—By C. L. Jackson and A. E. Menke ("Amer. Chem. Jour." [v], pp. 270–271). The camphor is dissolved in 10 parts of alcohol, a small excess of sodium gradually added, and the alcohol distilled off; water precipitates crude borneol. After washing with water it is crystallized from alcohol. The reaction is expressed: $C_{10}H_{16}O + H_2 = C_{10}H_{18}O$; the yield is excellent, 94 per cent. of the theoretical amount being obtained.—*Jour. Chem. Soc.*

Matico-camphor.—A specimen of matico-camphor (from *Piper angustifolium*), examined by K. Kügler ("Ber." [16], pp. 2841–2843, had

the odor and taste of matico-leaves, and melted between 89° and 103°. After repeated crystallizations, it melted at 94°, the mother-liquors containing a yellow amorphous resin. Matico-camphor exhibits a rotatory motion on the surface of water; it is not attacked by aqueous alkalies, is readily soluble in alcohol, ether, chloroform, benzin, and light petroleum. The pure substance lacks both taste and odor. In contact with hydrochloric acid, it assumes an intense violet color, which changes to blue and then to green, the compound yielding brown crystals from ether, showing green fluorescence, and having an ethereal odor. With sulphuric acid, it becomes yellow, then red, and finally violet. With sulphuric and nitric acids, it assumes first a yellow, then a violet, and finally a blue color. Matico-camphor has the formula $C_{12}H_{20}O$; it is, perhaps the ethyl-derivative of ordinary camphor.—*Ibid.*

Mannitol in the ananas.—In the course of the analysis of ananas from Pernambuco and Brazil, L. Lindet ("Bull Soc. Chim." [40], pp. 65–66) isolated crystals of mannitol; the quantity obtained was equal to more than 1 per cent. of the fresh fruit. The identity of the crystals with mannitol was established by combustion, crystalline form, solubility, and absence of rotatory and cupric oxide reducing power.

Function of tannin in plants.—E. Kutscher ("Bied. Centr.," 1883, p. 713).—Investigations were made with *Vicia faba, Helianthus tuberosus* and *annuus, Ricinus sanguineus,* and *Phaseolus multiflorus,* plants well adapted for the purpose, as they were found to be typical examples of the different locations of tannin; inasmuch as it is distributed throughout the plant in the *Vicia* and *Helianthus,* whilst it is only local and inactive in the *Ricinus* and *Phaseolus* plants. In the last two species, tannin is not found in the top of the plants, nor in the cell-walls, nor in the general sap during the period of vegetation; moreover, it is never equally distributed throughout the tissue-complex, but is confined in separate secluded cells where it, at the most, changes to a red coloring matter without being used in the general development, whilst with the *Vicia* and *Helianthus* tannin is found in all the tissues soon after germination, but disappears with the formation of organs. *Vicia* tannin is iron-green, *Ricinus* iron-blue. Tannin apparently takes part in the formation of and primary differentiation of the tissues, but does not take part in the further growth of the cell-walls; the most feasible use attributed to this substance is in aiding respiration.

Separation and Estimation of digitalin, digitalëin and digitin.—The

German method of separating digitalin from the other compounds occurring in *Digitalis purpurea* is based on the precipitation of the former by means of tannin; the French method on the insolubility of digitalin and digitin in water, digitaleïn being readily soluble.

Both methods are troublesome and demand much time. R. Palm ("Anal. Zeitschr. [23], pp. 22, 23) extracts the powdered herb with water, filters the solution through animal charcoal until it is colorless, and precipitates the organic acids with neutral plumbic acetate. A solution of lead acetate and alcoholic ammonia is then added to the filtrate as long as a precipitate is produced. This contains all the principles and is washed with water, and decomposed with hydrogen sulphide. The solution, separated from the precipitate, contains all the digitaleïn, the precipitate consisting of plumbic sulphide, digitalin and digitin. The digitalin is extracted from the dried residue by chloroform, and digitin with alcohol.

Action of Bromine on pilocarpine.—(Chastaing, *Comp. Rend.* [97], pp. 1435–1437.) When bromine is added to a solution of pilocarpine in chloroform, there is development of heat, the mixture becomes acid, and a heavy oily liquid separates. The supernatant chloroform retains the excess of bromine together with a small quantity of the bromo-derivative, which gradually crystallizes out. The oily liquid is rapidly evaporated, and forms a deep golden-yellow resinous mass, which is then dissolved in chloroform, from which it separates in a mass of minute prismatic crystals. These crystals have the composition $C_{11}H_{15}N_2O_2Br_5$, and consist of a *dibromide of dibromopilocarpine hydrobromide*, $C_{11}H_{14}Br_2N_2O_2HBr, Br_2$. This substance is inodorous, but when exposed to air it absorbs moisture and gives off ethyl bromide, undergoing some alteration which results in the formation of a compound containing less carbon than the original substance. In contact with copper, dibromide of dibromopilocarpine hydrobromide gives up part of its bromine, and when treated with silver oxide in presence of water and chloroform, it loses Br_3 and yields dibromopilocarpine, $C_{11}H_{14}Br_2N_2O_2$, which resembles pilocarpine in appearance, but is less mobile and less strongly alkaline; it is precipitated by platinum chloride.

The action of bromine on pilocarpine in presence of a small quantity of water does not yield dibromide of dibromopilocarpine hydrobromide, but the corresponding derivative of a feebler base which contains an atom of carbon less than pilocarpine. This carbon is given off as car-

bonic anhydride, and the compound formed should be represented by the formula $C_{10}H_{14}N_2O_2$, H Br, Br_2.—*Jour. Chem. Soc.*

Examination of fats.—E. Valenta (*Dingl. polyt. J.* [249], pp. 270–273) has examined a series of fats by a method proposed by J. Köttstorfer, for the detection of foreign fats in butter. The fat to be examined, if necessary, is filtered whilst warm, and a weighed portion is saponified with standard alcoholic solution of potash. After warming on the water-bath about fifteen minutes, the excess of potash is titrated by half normal hydrochloric acid, using phenolphthaleïn as indicator. Pure butter fat requires per gram about 227 mgrms. of potassium hydroxide for saponification, whilst many fats used for adulteration, such as suet, lard, bacon fat, mutton fat, rape oil, olive oil, oleomargarin, poppy oil, and walrus oil, require about 197 or 198 mgrms. The author has examined both animal and vegetable fats. Some of the results obtained tend to throw doubt on the suitability of the method for butter testing, whilst in other cases the nature of single fats can be ascertained, and adulteration can be detected quantitatively if somewhat considerable. The results obtained are given in tabular form. Palm-kernel oil with 247 mgrms., and cocoa nut oil with 257 to 268 mgrms., are much higher than any others of the list, excepting cod liver oil with 213 mgrms. Cocoa nut oil contains not inconsiderable quantities of lauric and myristic acids, also small quantities of caprylic acid, etc. These acids contain much less carbon in the molecule than do palmitic, stearic, and oleic acids, hence the high saponifying value of this fat. Apricot-kernel oil, oil of sweet almonds, oil of of bitter almonds, arachis oil, cotton-seed oil, olive, sesame oil, average 193 mgrms. Pumpkin seed oil, oil-cake oil, rape oil (Hungarian product), average 188·1 mgrms. Rape oil, mustard seed oil, and castor oil, average 177·1 mgrms. American bone fat, goose fat, pig fat, average 191 to 196.—*Ibid.*

Examination of beeswax.—(Hübl, *Dingl. polyt. J.* [249], pp. 338–342.) Along with physical examination, F. Becker's saponifying test is of value. This test is given as Köttstorfer's butter test. According to Becker, 1 gram beeswax requires 97 to 107 mgrm. potassium hydroxide for complete saponification. By mixing various waxy substances, impure beeswax can be made to give the same number. This difficulty can be overcome by ascertaining not only the total amount of potash required for complete saponification, but also that required to saturate the free acid (cerotic acid) present. Two numbers are thus

obtained, which bear the constant relation of 1 : 3·7, as determined in about twenty samples of yellow wax. About 4 grams wax is treated with 20 cc. neutral 95 per cent. alcohol, heated to fusion, and titrated with alcoholic potash solution, phenolphthaleïn being used as indicator. When the first number has been obtained, 20 cc. potash solution are added, and the excess titrated with half normal hydrochloric acid. For the acid in 1 gram wax about 19 to 21 mgrm. KHO are required, and for the saponification 73 to 76 more are required. The proportion varies between 1 : 3·6 and 1 : 3·8, and the total potassium hydroxide used is 92 to 97 mgrm. The author designates the numbers thus obtained as acid number, ether number, and saponifying number, respectively. Wax substitutes give very different values for these numbers, as the following average results show :

Substance.	Acid number.	Ether number.	Saponifying number.	Proportion ether : acid.
Japan wax	20	200	220	10
Carnauba wax	4	75	79	19
Tallow	4	176	180	44
Stearic acid	195	0	195	0 : 195
Resin	110	1·6	112	0·015
Neutral substances, Paraffin, Ceresin	0	0	0	0
Yellow beeswax	20	75	95	3·75

Hence if the saponifying number falls below 92 with a proper proportion, the wax is adulterated with an inert substance (*i. e.*, paraffin). If the proportion be greater than 3·8, an addition of Japan or carnauba wax or tallow is probable. If the acid number be low, Japan wax is excluded, and of the remaining two the ether number will determine which has been used. If the proportion be below 3·6, stearic acid or resin has probably been added. It is also clear that the simultaneous presence of an active and an inactive substance may be detected by the figures obtained. The subject is being further investigated.—*Ibid.*

Gelatin.—H. Weiske ("Bied. Centr." 1883, p. 673) has prepared gelatin in various ways, and has found that the products differ in properties. Pieces of bone were treated repeatedly and for a long time with dilute hydrochloric acid to remove the inorganic matter as com-

pletely as possible; they were then washed. Gelatin made from this is not precipitated from its solutions by tannic acid unless a few drops of a solution of a salt (sodium chloride, etc.) are added simultaneously; in other respects it does not differ from ordinary gelatin. By boiling bones free from mineral matter with repeated quantities of water, and then dissolving the residue by heating with water under pressure, two solutions are obtained which when evaporated to dryness at 100° yield two kinds of gelatin differing from one another and also from the above variety in various properties.

Valuation of Gelatin.—F. Prollius (*Dingl. polyt. J.* [249], p. 425) has determined the amount of ash, water, and insoluble matter (residue insoluble in hot water) in various kinds of gelatin. To ascertain the gelatinizing property 1 part of the sample was dissolved in 90 parts of water, filtered, and the degrees of viscosity determined.

	Ash.	Water.	Insoluble.	Time required for the solution to run out.
	per cent.	per cent.	per cent.	seconds.
Astracan from Schmidt and Dihlmann, Stuttgart	0·20	16·0	2·8	507
From a collection	0·37	18·0	0·7	485
Fine iridescent Russian quality, Tübingen collection	1·20	17·0	1·0	500
Russian, from Gehe of Dresden	0·80	19·0	3·0	491
In laminæ, from Gehe	0·50	19·0	0·4	480
In threads, known as Hamburg threads	0·40	17·0	1·3	477
Hamburg isinglass	1·30	19·0	2·3	470
Another quality	0·13	19·0	5·2	.....
Rolled northern fish bladder	3·20	1·5	10·8	467
Icelandish bladder	0·60	17·0	21·6	463
Indian isinglass	0·78	18·0	8·6	437
Yellow, quality unknown	2·30	17·0	15·6	360

To judge of the purity of isinglass, it is also recommended to subject the sample to microscopic examination.—*Ibid.*

Wine Examination.—(*Dingl. polyt. J.* [249], pp. 311–312) According to S. Kilicsan, not only young wines but old and well kept wines contain ammonia; in six samples from 0·0057 to 0·0113 per cent. was found. Formic acid can often be detected in the distillate from un-

sulphured wines. Since the precipitate produced in a wine distillate by silver nitrate contains carbon, probably from the presence of organic acids, Kilicsan considers Wartha's process for the detection of sulphurous acid in wines to be untrustworthy.

J. Nessler and M. Barth give a method for estimating free tartaric acid in wine as an improvement of the original Berthelot-Fleurieu's process. 50 cc. of wine are evaporated to thin syrup, this is well shaken with 70 cc. of 96 per cent. alcohol, and allowed to stand four hours in a cool place, to permit the tartrate to settle out. The precipitate is separated, and its acidity reckoned as tartrate. The filtrate is freed from alcohol, and 0·5 cc. of acidified 20 per cent. solution of potassium acetate is stirred into the syrupy residue, and the newly formed tartrate is estimated as before. But this method fails in case of wines strongly plastered, although negative values cannot be obtained, as are sometimes got by the older method.

For the estimation of sugar by Fehling's solution, the tannin must first be removed by lead acetate, the excess of lead being removed by sodium carbonate. Ordinary fully fermented wine usually contains under 0·1 per cent. sugar, and may be decolorized by a small quantity of animal charcoal; after rendering it alkaline with a little caustic alkali or carbonate, 5 cc. is warmed with 2 cc. Fehling, in a water-bath. If the blue color completely disappears the wine contains over 0·2 per cent. sugar. If the blue color persists 5 cc. more wine may be added, and the warming repeated. In this way an approximation to the amount of sugar may be made.

Decolorizing action of ferric salts on indigo.—L. Margary ("Gazzetta" [13], pp. 374, 375). In experiments on certain iron mordants for silk containing ferric sulphate and nitric acid, it was necessary to determine the amount of nitric acid present. This was done by means of indigo solution, and the author observed that the results were invariably too high. This he attributed to the oxidizing action of the ferric salt, and found on heating the indigo solution with pure ferric sulphate that it was rapidly and completely decolorized, the ferric being reduced to a ferrous salt.—*Jour. Chem. Soc.*

Estimation of phenol in commercial carbolic acid.—Kleinert ("Anal. Zeitschr." [23], pp. 1 to 13) has compared the results of estimating phenol by Koppeschaar's method (titration by means of standard bromine solution) and by fractional distillation. He finds that they in nowise agree, the bromine titration yielding figures which are far

higher than the quantity of phenol which can be present. All samples which he examined yielded but a very small proportion of products volatile between 150° and 200°, phenol distilling between those temperatures. Between 200° and 250° the largest fractions are obtained, practically devoid of phenol, and yet giving copious bromine precipitates. Even at temperatures higher than 250° distillates are obtained, which give the bromine reaction, but do not show the well-known phenol indications with ferric chloride, hypochlorite, or fir-wood and hydrochloric acid. Kleinert therefore concludes that Koppeschaar's method is not applicable for the valuation of commercial carbolic acid.

THE FIRST PHARMACOPŒIA,

PUBLISHED IN THE UNITED STATES OF AMERICA.

The Editor of the AMERICAN JOURNAL OF PHARMACY on a recent visit to Lancaster, Pa., was shown by Mr. Chas. A. Heinitsh, a little work, of whose existence he was not aware. Diligent inquiry among pharmacists and physicians in Philadelphia seems to show that this "Pharmacopœia" is now entirely unknown in Philadelphia, and is not to be found here in libraries. On applying to the librarian of the Surgeon General's office, Dr. Robert Fletcher, Assistant Surgeon U. S. A., kindly gave the information, that since the publication of the first volume of the Index Catalogue, a copy of the first edition of this Pharmacopœia, published in 1778, has come into the possession of the library, and that the title page is exactly like the one given further on, excepting that the name of Dr. William Brown does not appear, and that the publishers are Styner and Cyst.

From Mr. Heinitsh it is learned that the hospital of the United States Army, located in Lititz, Lancaster Co., Pa., was in the building at present occupied by the Lititz Academy, formerly the Brothers House, and that a number of soldiers died there and were buried near the village.

The "Pharmacopœia" is printed entirely in Latin upon 32 pages, the printed text occupying upon each page 4¼ inches in length and 2½ inches in width. In the following the English translation of the title and preface, made by Professor Nevin, of Franklin and Marshall College, is added; with this exception, no alteration or addition has been made.

July, 1884.

PHARMACOPOEIA

Simpliciorum & Efficaciorum,

IN USUM

NOSOCOMII MILITARIS,

AD EXERCITUM

Fœderatarum *Americæ* Civitatum

PERTINENTIS;

HODIERNÆ NOSTRÆ INOPIÆ RERUMQUE ANGUSTIIS,

Feroci hostium sævitiæ, belloque crudeli ex inopinato patriæ nostræ illato debitis,

MAXIME ACCOMMODATA.

AUCTORE GULIELMO BROWN, M. D.

Editio Altera.

PHILADELPHIÆ:
Ex Officina CAROLI CIST.
M.DCC.LXXXI.

REPERTORY

OF

Simple and Efficacious Prescriptions,

FOR THE USE OF THE

MILITARY HOSPITAL,

BELONGING TO THE ARMY

OF THE

UNITED STATES OF AMERICA.

ADAPTED ESPECIALLY TO OUR PRESENT STATE OF NEED AND POVERTY, WHICH WE OWE TO THE FEROCIOUS CRUELTY OF THE ENEMY, AND TO A CRUEL WAR BROUGHT UNEXPECTEDLY UPON OUR FATHERLAND.

WM. BROWN, M. D., AUTHOR.

SECOND EDITION.

PHILADELPHIA:
FROM THE OFFICE OF CHARLES CIST.
1781.

DISTINGUUNTUR asterisco medicamentorum formulæ, quæ apud commune operarium præparari et componi debent; cæteræ inter nosocomiorum officinas sunt extemporè miscendæ.

Plurimæ sunt formulæ solidæ et siccæ quæ commodius vel saltem elegantius liquidâ formâ adhiberi possent, nisi defuerit imprimis phialarum copia; et omnia, quæ minus efficacia, pro recipientibus vel causa elegantiæ tantum usui sunt, quales aquæ simplices, &c. variaque emplastra et unguenta vix necessaria aut utilia, transportandi incommodo vitare velimus.

LITITZ, Mart. 12, 1778.

With an asterisk, are denoted such prescriptions, as ought to be prepared and compounded in the general laboratory, the others are to be mixed for the occasion at the office of the hospitals.

There are very many prescriptions of medicines, solid and dry, which might be afforded more convenient for use, or, at any rate, more elegantly, in a liquid form, were there not wanting for this a sufficiency of phials; and all such preparations as are less efficacious, or for patients made use of only for the sake of elegance, such as simple waters, etc. and various plasters and unguents hardly necessary or useful, from the inconvenience of transportation, it is our desire to avoid.

LITITZ, March 12, 1778.

PHARMACOPOEIA, &c.

PARS I.

MEDICAMENTA INTERNA.

1. AQUA ACIDULA. (*Posca* Roman.)

REC. Aceti vinosi, vel, pomacei, *unc.* iv, vel
Pulv. crem. tartar. *drachm.* ii.
Aquæ fontanæ *lib.* iss. Misce.

Pro potu communi antiseptico, *unc.* iv. 6ties die, vel ad libitum, sumendæ:

Addi possint, pro re nata, spiritus vini tenuis *unc.* ii.

2. AQUA VINOSA.

REC. Vini Maderensis *unc.* viii. vel rubri *unc.* xii.
Aquæ fontanæ *lib.* i. Misce.

Pro potu—in statu ac decursu febris castrensis et malignæ utendo, ad vacillantem tonum corporis sustinendum, *viresque naturæ medicatrices* refocillandas, evocandasque—*unc.* iv. 6ties die, vel sæpius sumendæ.

3. AQUÆ HORDEATA, ORIZATA, ex PANE COCTO, vel ex PANE TOSTO.

Fiunt priores tres coquendo hordei perlati, vel orizæ *unc.* ii. vel panis domestici *unc.* iv. in aquæ fontanæ *lib.* iv. ad dimidii consumptionem, i. e. ad *lib.* ii; et *aqua ex pane tosto*, infundendo per semihoram panis tosti jam præ foco ferventis *unc.* iv. in aquæ fontanæ *lib.* ii.

Usurpari possint hæc pro potu communi, et inter se mutari vel pro ægri desiderio, vel promptuarii rerumque nosocomii commodo.

4. AQUA CALCIS.

REC. Calcis vivæ *lib.* i.
Affunde gradatim
Aquæ fontanæ *cong.* ii.

Post ebullitionem, subsidentiâ depuretur mixtura; deinde per chartam coletur, et in vasis vitreis bene clausis servetur.

Dosis a *lib.* i. ad *lib.* ii. die.

Utilis est etiam in chirurgicis, pro lotione, ad ulcera mali moris, &c.

5. BOLUS e CRETA.

REC. Cretæ ppt. *scrupul.* i.
Laudani liquidi *gutt.* v.
Mucilag. gum. Arab. q. s.

Sumendus 2da 3tia vel 4to quaque hora.

6. BOLUS VOLATILIS.

REC. Sal. C. C. volat. vel
Sal. ammon. volat. (a)
Camphoræ ana *gr.* v.
Conserv. rosarum q. s.

Pro una dosi 3tia vel 4ta quaque hora sumenda.

7. Fit etiam cum OPIO, addendo
Opii puri *gr.* ½

Eodem modo sumendus.

8. BOLUS e RHÆO cum MERCURIO.

REC. Pulv. rhæi *gr.* xxv.
Calomel. ppt. *gr.* v.
Syrup. sacchar. q. s.

Mane sumendus.

9. BOLUS LIXIVIALIS.

REC. Sal. tartar. *gr.* x.
Conserv. rosar. *scrupul.* i. M.

Ter quaterve die sumendus.

10. COLLYRIUM VITRIOLICUM.

REC. Vitriol. albi *scrupul.* i.
Aquæ fontanæ *unc.* iv. M.

Ter die utendum.

11. *CONSERVA ROSARUM. *Pharm. Lond.*

12. DECOCTUM CORTICIS PERUVIANI.

REC. Pulv. crass. cort. Peruvian. *unc.* i.
Aquæ fontan. *lib.* iii.

Coque

(a) *Si desit sal volatile ad hunc bolum componendum, uti possint ejus loco sal. ammoniac. crud.* gr. x. *cum sal. tartar.* gr. v. *quo sal volatile ammoniac. extemporè præparetur.*

Coque ad *lib.* ii. et cola.
Dosis ab *unc.* i. ad *unc.* iv. quaque, vel 2da quaque hora.

13. DECOCTUM CORTICIS cum SERPENTARIA.

Fit addendo decocto corticis Peruviani, sub finem coctionis,
Rad. serpentariæ contus. *semunciam.*
Dosis ab *unc.* i. ad *unc.* iii. quaque, vel 2da quaque hora.
His utrisque addi possit, pro re nata,
Elixir vitrioli acid. *drachm.* i.

14. DECOCTUM CORTICIS cum VINO.

Fit addendo decocto cort. Peruviani
Vini rubri *lib.* ii. vel
REC. Singulorum P. Æ. et misce.
Dosis ut decocti cort. Peruvian.

15. DECOCTUM RADICIS SARSAPARILLÆ.

REC. Rad. sarsaparill. *unc.* iii.
Aquæ fontanae *lib.* iii.
Coque ad *lib.* ii. et sub finem coctionis adde
Rad. glycyrrhiz. *drachm.* ii.
Colaturæ dosis a *lib.* i. ad *lib.* ii. die.
Adde, pro re nata,
Vini antimonialis *drachm.* ii.

16. DECOCTUM TORMENTILLÆ.

REC. Rad. tormentillæ contus. *unc.* i.
Pulv. C. C. C. *unc.* ii.
Pulv. gum. Arabic. *semunciam*
Aquæ fontanæ *lib.* iii.
Coque ad *lib.* ii. et sub finem coctionis adde
Cort. cinnamomi contus. *drachm.* i.
Colaturæ admisce
Sacchari albi *drachm.* ii.
Dosis ab *unc.* ii. ad *unc.* iv. ter quaterve die.
Adde, pro re nata,
Laudani liquidi *gutt.* xl.

17. ELECTARIUM CORTICIS CHALYBEATUM.

REC. Pulv. cort. Peruvian. *unc.* i.
Rubiginis, vel limiturae ferri ppt.
Pulv. canellæ albæ ana *drachm.* ii.
Syrupi q. s. M.
Dosis *drachm.* i. ter quaterve die.

18. *ELECTARIUM LENITIVUM. *Pharm. Edin.*

Vel, omittatur cassia fistularis, et duplicentur tamarindi.
Dosis *drachm.* ii. mane.

19. ELECTARIUM LENITIVUM cum NITRO.

REC. Elect. lenitiv. *unc.* ii.
Pulv. sal. nitri *semunciam.* M.
Dosis *drachm.* i. bis terve die.

20. ELEC. LENITIVUM BALSAM.

REC. Elect. lenitiv. *unc.* ii.
Balsam. capivi
Gum. guaiac. ana *semunciam.* M.
Dosis *drachm.* i. omni nocte, vel mane et vespere.

21. ELECT. seu LOHOCH de SPERMATE CETI.

REC. Spermatis ceti *unc.* i.
Mellis *unc.* ii.
Balsam. Peruvian. *drachm. ss.* M.
Dosis *drachm.* i. 2da quaque hora, vel sæpius, urgente tussi.

22. Fit etiam, cum OPIO, addendo
Laudani liquidi *drachm.* i.

23. *ELIXIR PAREGORICUM. *Pharm. Lond.*

24. *ELIXIR VITRIOLI ACIDUM.

REC. Canellæ albæ.
Rad. zingiberi ana *unc.* i.
Spiritus vini tenuis *lib.* ii.
Digere leni calore, et cola: Adde gradatim miscendo
Olei vitrioli *unc.* viii.
Mixtura subsidentiâ depurata coletur per chartam.
Dosis *gutt.* xxv. bis terve die, in poculo aquæ fontanæ sumendæ; vel misceri possit cum potu communi ad gratam aciditatem.

25. ENEMA COMMUNE.

REC. Aquæ fontanæ calidæ *unc.* xii.
Salis communis *semunciam*
Olei olivarum, vel ol. sem. lini, vel axungiæ porcinæ *unc.* i.
M.

26. ENEMA

26. ENEMA ANODYNUM.

REC. Infusi seminum lini *unc.* vi.
Laud. liquidi *gutt.* xl. M.

27. EPITHEMA VESICATORIUM.

REC. Unguenti basilic. flav. super alutam, linteum, vel chartam crassè extensi, q. s.
Asperge
Pulv. subtil. cantharidum, q. s.
Post levem manu pressionem, excutè superfluum pulverem unguento non hærentem:
Pauxillo aceti madefactâ prius cute, applicetur.

28. FOTUS ANODYNUS.

REC. Capit. papaver. hortens. *unc.* i.
Aquæ fontanæ *lib.* iii.
Coque ad *lib.* ii. et adde
Aceti *lib. ss.*
Vel eidem quantitati aquæ calidæ et aceti adde laud. liquid. *drachm.* ii.

29. FOTUS SPIRITUOSUS.

REC. Aquæ calidæ *lib.* ii.
Aceti
Spir. vini tenuis ana *lib. ss.* M.

30. GARGARISMA COMMUNE.

REC. Sal. nitri *drachm.* i.
Aceti *unc.* ii.
Mellis *semunciam*
Aquæ fontanæ *unc.* vi. M.

31. GARGARISMA ADSTRINGENS.

REC. Decocti cort. Peruvian. *unc.* vi.
Elixir vitrioli acid. *drachm.* i.
Mellis *unc.* i. M.

32. HAUSTUS ANODYNUS.

REC. Laudani liquidi *gutt.* xxv.
Aquæ fontanæ *unc.* iss.
Syrupi *drachm.* ii. M.

33. INFUSUM CHALYBEATUM.

REC. Rubiginis, vel limaturæ ferri ppt. *unc.* iv.
Rad. gentianæ contus. *unc.* ii.
Cort. Canellæ albæ contus. *unc.* i.
Vini pomacei veteris *lib.* viii.
Infunde per aliquot dies.
Dosis *unc.* ii. ter quaterve die.

34. INFUSUM SEMINUM LINI.

REC. Sem. lini integr. unc. ii.
Aquæ bullientis *lib.* iv.
Sepone ad focum per horas duas, et cola.
Dosis *unc.* iv. 6ties die; vel pro poto communi.

35. INFUSUM SASSAFRAS.

REC. Radicis, ligni, vel corticis sassafras contus. *unc.* i.
Aquæ bullientis *lib.* iv.
Infunde per 4 horas, et cola.
Dosis *unc.* iv. 6ties die.
Addi possit, pro re nata,
Vini antimonialis *semuncia.*

36. INFUSUM SERPENTARIÆ.

REC. Rad. Serpentariæ *unc.* i.
Aquæ bullientis *lib.* ii.
Infunde per 4 horas, et cola.
Dosis *unc.* ii. 3tia vel 4ta quaque hora.

37. INFUSUM SENNÆ.

REC. Fol. sennæ *semunciam*
Fruct. tamarind. *unc.* i. vel
Pulv. crem. tartar. *semunciam.*
Aquæ bullientis *lib.* i.
Infunde per horam, et cola.
Pro unâ dosi. *unc.* iv. quaque semihorâ sumendæ ad alvi solutionem.

38. INJECTIO MERCURIALIS.

REC. Unguenti mercurialis *semunciam:*
Solve in
Olei olivar. vel amygdal. d. *unc.* iv.
Utende mane et vesperè, vel ter die.

39. INJECTIO BALSAMICA.

REC. Balsam. capivi *drachm.* ii.
Ol. olivar. vel amygdal. d. *unc.* iv. M.
Utenda mane et vesperè, vel ter die.

40. LINIMENTUM ANODYNUM.

REC. Axungiæ porcinæ *unc.* ii.
Laudani liquidi *semunciam.*
Misce intime.
Ad hæmorrhoïdes; vel ad dolorem spasticum ægrè tolerabilem.

41. LINI-

41. LINIMENTUM CAMPHORATUM.

REC. Camphoræ *semunciam.*
Ol. olivarum, amygdal. dulc. juglandum, vel sem. lini sine calore expressi *unc.* ii. M. s. a.

42. LINIMENTUM VOLATILE.

REC. Linimenti camphorati *unc.* ii.
Sp. sal. volat. ammoniac. *semunciam.* M.

43. MAGNESIA ALBA. *Pharm. Edin.*

Dosis a *drachm.* i. ad *drachm.* ii.—Pro cathartico leni et utili, valente acido stomachi indigeno.

44. MUCILAGO GUMMI ARABICI.

REC. Gum. Arabic. *unc.* iv.
Aquæ fontanæ *unc.* x. M. s. a.

45. *OLEUM RICINI, *Emptitium.*

46. PILULÆ ALOETICÆ.

REC. Aloës succotrin.
Saponis Hispan. ana. P. Æ.
Syrupi q. s.
Dosis a *gr.* x. ad *gr.* xxv.

47. PILULÆ AMMONIACÆ.

REC. Gum. Ammoniac. *unc.* ii.
Saponis Hispan. *unc.* i.
Balsam. capivi q. s. M.
Dosis a *gr.* x. ad *gr.* xv. ter die.

48. PILULÆ ANTIMONIALES cum MERCURIO.

REC. Tartar. emetic. *drachm.* i.
Calomel. ppt. *drachm.* ii.
Syrupi q. s.
Formetur massa in pilulas 120.
Dosis i. omni nocte; vel bis terve die.

49. PILULÆ CALOMELANÆ.

REC. Calomel. ppt. *scrupul.* i.
Micæ panis *scrupul.* ii.
Syrupi q. s.
Formetur massa in pilulas 20.
Dosis i. ii. vel iii. omni nocte, vel bis die.

50. PILULÆ CHALYBEATÆ.

REC. Sal. martis calcinati *drachm.* i.
Terebinthinæ venetæ *drachm.* ℔ss.
Pulv. gum. myrrh. q. s.
Formetur massa in pilulas 60.
Dosis ab i. ad iii. ter die.

51. PILULÆ ex HYDRARGYRO.

REC. Hydrargyri *drachm.* i.
Mellis *drachm.* i.
Tere simul in mortario marmoreo ad perfectam globulorum extinctionem:
Dein adde
Micæ panis q. s.
Formetur massa in pilulas 60.
Dosis i. vel ii. mane, et ii. vel iii. vespere, cum decocto rad. sarsaparillæ—ad luem venereum.

52. PILULÆ e JALAPIO cum MERCURIO.

REC. Pulv. rad. jalapii *semunciam.*
Calomel. ppt. *drachm.* i.
Syrupi q. s. M.
Dosis a *scrupul.* i. ad *scrupul.* ii.

53. PILULÆ e SENEKA.

REC. Pulv. rad. senekæ *scrupul.* i.
Saponis Hispan. *semunciam.* M.
Dosis a *gr.* x. ad *gr.* xv. 6ties die.
Ad calculum—vel ad febres intermittentes pertinaciores.

54. *PILULÆ ex EXTRACTO MYROBALANI. (a)

REC. Corticis, vel radicis myrobalani contus. q. s.
Aquæ fontanæ q. s.
Coque ut fiat decoctum fortius, et cola: Deinde per evaporationem leni calore peractam, more solito fiat *extractum molle;* ex quo formentur pilulæ *gr.* v.
Dosis a ii. ad v.—Pro cathartico leni, grato et efficaci; vi quoque tonicâ pollenti.

55. PILULÆ e RHÆO.

REC. Pulv. rhæi *gr.* xxv.
Pulv. aromatic. *gr.* v. vel ol. cinnamom. *gutt.* i.
Syrupi. q. s. M.
Pro unâ dosi—hora somni, vel mane sumenda.

56. PILULÆ FOETIDÆ cum ALOE.

REC. Gum. asæ fœtid. *scrupul.* i.
Aloës succotrin. *gr.* v.
Mucilag. gum. arabic. q. s.
Formetur massa in pilulas 4.
Dosis a ii. ad iv.—Utenda in gravi stomachi flatulentiâ cum alvi constipatione.

(a) *Anglicè* WHITE WALNUT, *sive* BUTTER-NUT.

stipatione, quæ aliquando in febre malignâ et castrensi ocurrit, ad flatum deorsum expellendum.

57. PILULÆ OPIATÆ.

REC. Opii puri *scrupul.* i.
Saponis Hispan. *drachm.* i. M.
Formetur massa in pilulas 20.
Dosis i. vel ii. hora somni.

58. PILULÆ PICEÆ.

REC. Picis liquidæ q. v.
Pulv. cascarillæ q. s. M. s. a.
Dosis *gr.* xv. vel *scrupul.* i. ter die.

59. PILULÆ SAPONACEÆ cum RHÆO.

REC. Saponis Hispan. *drachm.* vi.
Pulvis rhæi *drachm.* ii.
Syrupi q. s. M.
Dosis a *scrupul.* i. ad *scrupul.* ii. bis terve die.

60. PILULÆ SCILLITICÆ.

REC. Pilul. ammoniac. *unc.* i.
Pulv. scillæ aridæ *drachm.* iss. M.
Dosis *gr.* x. vel *gr.* xv. ter die.

61. *PULVIS AROMATICUS.

REC. Canellæ albæ.
Rad. zingiber. ana P. Æ. M.
Fiat pulvis.
Dosis a *gr.* v. ad *scrupul.* i.

62. *PULVIS ALUMINOSUS.

REC. Alum. crudi.
Terræ japonicæ, ana P. Æ. M.
Dosis a *gr.* viii. ad *drachm.* ss.

63. PULVIS ANTIMONIALIS.

REC. Tartar. emetic. *drachm.* i.
Cretæ ppt. *unc.* i. M.
Dosis a *gr.* x. ad *scrupul.* i. pro emetico; vel a *gr.* ii. ad *gr.* viii. 3tia vel 4ta quaque hora, pro diaphoretico.

64. PULVIS ANTIMONIALIS NITROUS.

REC. Tartar. emetic. *gr.* ii.
Salis nitri *drachm.* iii. M.
Dosis a *gr.* xv. ad *drachm.* ss. 2da vel 3tia quaque hora.

65. Fit etiam cum OPIO, addendo

Gum. opii *gr.* ii.
Eodem modo sumendus.

66. PULVIS

66. PULVIS CAMPHORATUS NITROSUS.

REC. Camphor. *drachm.* ss.
Sal. nitri *drachm.* ii. M.
Dosis a *gr.* xv. ad *drachm.* ss. 2da vel 3tia quaque hora.

67. Fit etiam cum OPIO, addendo

Gum. opii *gr.* ii.
Eodem modo sumendus.

68. *PULVIS CORTICIS PERUVIANI.

Dosis a *drachm.* ss. ad *drachm.* i. quaque vel 2da quaque hora.

69. PULVIS CORTICIS cum SERPENTARIA.

REC. Pulv. cort. Peruvian. *unc.* i.
Pulv. rad. serpentar. *drachm.* ii. M.
Dosis *drachm.* ss. quaque, vel 2da quaque hora.

70. PULVIS CORTICIS cum OPIO.

REC. Pulv. cort. Peruvian. *unc.* i.
Laudani liquidi *gutt.* xxx.
Terantur simul in mortario ut intimè misceantur.
Dosis *drachm.* ss. quaque, vel 2da quaque hora.

71. PULVIS e JALAPIO cum CREMORE TARTARI.

REC. Pulv. jalapii *drachm.* i.
Cremor. tartari *semunciam.* M.
Dosis *scrupul.* i. 2da vel 4ta quaque hora, ut alvus leniter moveatur.

72. PULVIS GUAIACINUS ANTIMONIALIS.

REC. Gum. guaiaci *drachm.* ii.
Camphoræ *drachm.* ss.
Tartari emetic. *gr.* iss. M.
Dosis a *gr.* xv. ad *gr.* xxv. ter die.

73. PULVIS GUAIACINUS NITROSUS.

REC. Gum. guaiaci *drachm.* i.
Sal. nitri *drachm.* ii. M.
Dosis a *scrupul.* i. ad ii. ter quaterve die.

74. PULVIS NITROSUS.

Est sal nitri in pulverem redactus.
Dosis a *scrupul.* i. ad ii. 2da quaque hora.

75. *PULVIS

75. *Pulvis Ipecacuanhæ.

Dosis *gr.* xv. pro emetico :— vel *gr.* i. 4ta quaque hora, ad diarrhœam.

76. Pulvis Ipecacuanhæ cum Opio.

REC. Pulv. Ipecacuanhæ *scrupul.* i.
Gum. opii *gr.* v.
Cretæ ppt. *drachm.* ii. Misce intimè.

Dosis a *gr.* x. ad *scrupul.* i. ter die, ad diarrhœam ;— vel *drachm. ss.* hora somni, ut eliciatur sudor.

77. Pulvis Scillliticus Nitrosus.

REC. Pulv. scillæ aridæ *drachm.* i.
Salis nitri *drachm.* ii*ss.*
Piperis Jamaicensis *drachm. ss.* M.

Dosis a *gr.* v. ad *gr.* xv. ter quaterve die.

78. Solutio Emetica.

REC. Tartari emetic. *gr.* v.
Aquæ fontanæ *unc.* v. Fiat solutio.

Dosis *unc. ss.* quaque semihora ad vomitum.

79. Solutio Cathartica.

REC. Sal. cathartic. amar. vel Glauberi *unc.* i.
Mannæ opt. *unc. ss.* Solve in
Aquæ calidæ *unc.* iv. et cola.

Pro unâ dosi, duabus haustibus intervallo semihoræ sumenda.

80. Solutio Mercurii Corrosivi Sublimati.

REC. Mercurii corros. sublimat. *gr.* xvi.
Aquæ fontanæ *lib.* i. M.

Dosis a *drachm.* ii. ad *semunciam*, mane et vespere.

Utilis est etiam pro lotione phagedænicâ.

81. *Tinctura Corticis Peruv.

REC. Pulv. cort. Peruvian. *unc.* ii.
Cort. aurantiorum contus. *unc.* i*ss.*
Rad. serpentariæ contus. *semunciam.*
Spiritus Jamaicensis *lib.* i*ss.*

Infunde per 4 dies, et cola.

Dosis a *drachm.* i. ad *semunciam* bis, ter, quaterve die.

82. *Tinctura Opii, vulgo Laudanum Liquidum.

REC. Gum. opii *unc.* ii.
Piperis Jamaicensis *drachm.* ii.
Spiritus vini tenuis *lib.* i*ss.*

Digere leni colore, et cola.

83. *Vinum Antimoniale.

REC. Vitri antimonii *unc.* iv.

Teratur in mortario vitreo ut fiat pulvis ; cui affunde
Vini Maderensis *lib.* ii.

Digere leni calore per decem dies; dein per chartam cola.

Dosis a *semuncia* ad *unc.* i. pro emetico ; vel a *gutt.* xx. ad *gutt.* xl. 2da quaque hora, pro diaphoretico— ad febres, &c.

84. *Syrupus Sacchari. *Syrupus Communis, Pharm. Edin.*

Vel, ejus loco uti possit syrupus empyreumaticus, ex insulis emptitius, *molasses* vulgo dictus.

PARS

PARS II.

MEDICAMENTA EXTERNA, seu CHIRURGICA.

1. *ACETUM LITHARGYRITES. vulgo EXTRACTUM SATURNI.

REC. Lithargyri lævigati *lib.* i.
Aceti vinosi optimi *lib.* iv.
Digerantur per aliquod tempus; dein coquendo et commovendo, quantum fieri possit, solvatur lithargyrus, et continuetur coctio donec acetum syrupi spissitudinem habeat: Hoc effuso eodem modo repeti possit operatio, si lithargyro ad fundum manenti novum pro portione apponatur acetum.

2. AQUA SATURNINA.

REC. Aceti lithargyritis *drchm* ii.
Aquæ fontanæ *lib.* i. M.
Utilis est pro lotione— ad intertriginem seu inflammationem externam (*phlegmon*); in componendis cataplasmatibus antiphlogisticis;—pro collyrio, in quibusdam ophthalmiis; et pro injectione (nonnunquam sed cautè usurpanda) in stillicidiis.

3. *CAUSTICUM LUNARE, *Pharm. Lond.*

4. *LAPIS INFERNALIS, *Pharm. Lond.*

5. *MERCURIUS PRÆCIPITATUS RUBER, *Pharm. Lond.*

6. LINTEUM PRÆPARATUM.

REC. Vitrioli Cærulei *drachm.* i.
Aquæ fontanæ *unc.* i. M.
Fiat solutio, cui immergatur linteum more solito carptum, ut de toto madefiat; seponatur super mundam tabulam donec aridum sit; dein servetur pro usu.

7. *TINCTURA MYRRHÆ et ALOES. *Pharm. Lond.*

8. *EMPLASTRUM COMMUNE.

REC. Lithargyri *lib.* iii.
Ol. olivarum *lib.* vi. Misce et coque ut fiat emplastrum, s. a.

9 *EMPLASTRUM ADHÆSIVUM.

REC. Emplast. communis *lib.* ii.
Picis Burgundicæ *lib.* i.
Liquefiant simul ut fiat emplastrum.

10. *UNGUENTUM BASILICUM FLAVUM, *Pharm. Edin.*

11. *UNGUENTUM e Lapide CALAMINARI, *Pharm. Edin.*

12. *UNGUENTUM CEREUM.

REC. Olei Olivarum *lib.* i.
Ceræ flavæ *unc.* iv. M. s. a.

13. *UNGUENTUM e PRÆCIPITATO RUBRO.

REC. Unguenti basilic. flav. *lib.* i.
Mercurii præcipitati rubri *drachm.* v.
Misce s. a.

14. *UNGUENTUM MERCURIALE.

REC. Hydrargyri *lib.* i.
Sevi ovilli, vel bovilli, *lib.* i.
Axungiæ porcinæ *lib.* iii.
Misce simul terendo in mortario ut fiat unguentum cæruleum, s. a.

15. UNGUENTUM SATURNINUM.

REC. Unguenti cerei *lib.* i.
Sacchari saturni *unc.* i. M. s. a.

16. *UNGUENTUM SULPHURATUM.

REC. Sulphuris triti *lib.* i.
Axungiæ porcinæ *lib.* ii. M. s. a.

FINIS.

VARIETIES.

WHITE'S COUGH SYRUP.—Syr. tolutani ℥ij ; syr. scillae comp. ℥vj ; syr. ipecacuanhæ ℥vj ; glycerini ℥iv; tinct. lobeliæ ℥vj ; tinct. opii camph. ℥vj; extr. pilocarpi fluid. ℥ij ; ammonii chlorid. ℥i. M. Take a teaspoonful three times during the day, and every hour or two before going to bed.—*Med. World.*

SUBSTITUTE FOR MERCURIAL OINTMENT.—Vomacka gives the following directions for its preparation : One part of soft and perfectly neutral potash soap is mixed with a little glycerin in a glass mortar, and one part of mercury is added with constant trituration. When no globules of mercury are any longer visible, add two parts more of potash soap to make four parts. It may be scented with lavender or other essential oil.—*Med. and Surg. Reporter*, May 31.

AN INHALATION FOR CATARRH, CORYZA, ASTHMA, ETC.—M. St. Martin recommends this formula in the "Jour. de Med. Paris." Acidi carbolici 5 parts; ammon. pur. liq. 7 parts ; aquæ dest. 10 parts ; alcohol 15 parts. Soak some cotton wool with this mixture, and breathe this vapor from a wide-mouthed bottle.—*Amer. Med. Digest*, May 15.

CHLORAL AS A PURGATIVE.—In the "Gazetta Medica Italiana," Provincie Venete, Dr. Bonatti speaks highly of the use of hydrate of chloral, in doses of 2 to 3 Gm. (30–45 gr.), in a draught of senna, as a purgative in obstinate constipation of the insane, after croton oil and other cathartics had been used without avail.—*New York Medical Journal.*

THE DANGER OF CHLORATE OF POTASSIUM indiscriminately administered is dwelt upon editorially in the "Indiana Medical Journal," and cases of poisoning and deaths are quoted as a result of its use. The editor very properly says : "Physicians should correct the very prevalent error in the minds of the people that it is a harmless agent." He might have added that physicians should correct this error in their own minds. A mistaken idea of its physiological action has made it a fashionable agent in zymotic diseases, especially diphtheria and scarlatina, and we have no hesitation in asserting that death in these two diseases has not infrequently been caused by its excessive use. The routine prescription of tincture of chloride of iron, and chlorate of potassium in the above mentioned diseases is not only unscientific, but absolutely harmful in a high degree.—*Weekly Med. Review*, Aug. 2.

NUX VOMICA AS A GALACTAGOGUE.—Dr. Posada Arango speaks very highly of the good effect of nux vomica as a stimulant to the secretion of milk. He gives ten drops of the tincture three times a day, and explains its galactagogue properties by its action on the mammary gland, exciting it to secretion, and by its stimulating action on the stomach facilitating digestion. He recommends strychnine in recent cases of complete suppression of the secretion.—*Lond. Med. Record, Cinc. Lancet and Clinic.*

EDITORIAL DEPARTMENT.

OPPOSITION TO THE PHILADELPHIA PHARMACY LAW.—Some years ago a violent but unsuccessful onslaught was made by certain individuals against the pharmacy law of 1872, the principal feature being the bold assertion—without proof—that the law was gotten up for the sole benefit of the Philadelphia College of Pharmacy; the circular that was then issued, was last year used by the same anonymous parties, to help defeat the State Pharmacy Bill then pending before the Legislature. At the present time a circular without any signature is being distributed, which is exceedingly solicitous about the welfare of College, in expressing the fear that this institution would be injured by the continued enforcement of the law in question. Now which of the two great unknown is correct in his assertions? It is not worth the while to follow and refute the crude statements advanced, but for the benefit of those who are battling against the so-called "cutters," it should be said that these individuals have sprung up "under the incubus of the pharmacy law,"—how? the circular unfortunately omits to state. If as the unknown individual states, the pharmacy law is unconstitutional, the easiest way to get rid of it would be to contest it before the courts, which, however, was to some extent, unsuccessfully tried about ten years ago.

It is not unlikely that the present circular has been written rather in opposition to the new Pharmacy Board, than to the law; but as long as the Board, which consists of Messrs. J. J. Ottinger, J. L. Supplee, H. P. John, J. F. Hays, *Secretary*, and Dr. L. Wolff, *President*, continue to enforce the law according to its letter and its intentions, we presume it must be considered far easier to repeal the law, than to overthrow the legal status of the Board, which will probably sooner or later be superseded by a State Board of Pharmacy.

POISONS IN MEDICINES.—A curious case of poisoning, resulting in the death of one person and the narrow escape of four others, occurred in Philadelphia, August 1, merely as the result of "a good joke." A box containing about 50 or 60 granules of strychnine, $\frac{1}{20}$ grain each, was passed around at the supper table each one of the five persons taking according to their foolhardy fancy, with the result stated. It appears that a physician had prescribed these granules for a former boarder, who on removing, left the box behind with what remained of the one hundred granules originally prescribed. The box was properly labeled, though the word poison did not appear on the lid.

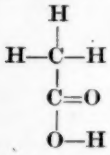
We do not regard it as judicious to prescribe large quantities of deadly poisons; even in case they have to be used for a certain period, it would certainly be better to renew the medicine frequently in small quantities than to run the risk of accident or as in this case, of senseless rashness or practical joking, which is possible, in case the dangerous medicine be pleasant in taste and of inviting appearance, or even harmless looking like sugar granules.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Grundzüge der Organischen Chemie. Von Dr. Aug. Laubenheimer, Professor. Heidelberg: Carl Winter's Universitätsbuchhandlung, 1884. 12mo, pp. 876.

Fundamental Traits of Organic Chemistry.

In the introductory portion the author defines the field of the so-called organic chemistry, or more properly of the chemistry of the carbon compounds, and describes the methods of ultimate analysis, of ascertaining the molecular formula and of determining vapor densities. The difference between empirical, rational and structural formulas is next explained, acetic acid being used as an example, and the reasons given for writing the empirical formula $C_2H_4O_2$, the rational formulas $C_2H_3O_2.H$, or $C_2H_3O.OH$, or $CH_3.CO_2H$, and the structural formulas



or $CH_3—CO—OH$.

After discussing the theory of the structure of the carbon compounds, isomerism, polymerism, and homologues, a chapter on terminology and classification gives us an insight into the general arrangement of the work. The carbon compounds may be viewed in regard to their chemical functions or with reference to their genetic relations; the latter would necessitate an arrangement by which the simplest compounds, hydrocarbons, are gradually converted, by substitution or addition, into the more complicated compounds. But whatever system be adopted the position of any one compound is determined by the two factors mentioned, its chemical function *and* its genetic relation. As an introduction into organic chemistry the author prefers a system in which the first consideration predominates, and whereby groups of the carbon compounds are characterized in their various general relations.

The hydrocarbons form two natural classes, the so-called fatty group and the benzol group with their derivatives, containing halogens, oxygen, nitrogen, phosphorus, arsenic, boron and other elements. The oxygen compounds are again classified as alcohols, ethers, aldehyds, ketones, carbonacids, esters or compound ethers and anhydrides; and the nitrogen compounds form the nitro group, nitroso-group, amines and amides.

To show the advantage of such a system for the beginner we may refer to the hydroxyl-derivatives of the methane series which are grouped as mono-, di-, tri-, tetra- and hexa-hydric alcohols, the first one comprising those, to which the ordinary alcohol belongs. In this group is first explained the difference in constitution between the primary, secondary and tertiary alcohols; next the production of the alcohols and their isomers; the transformation of primary into secondary and tertiary alcohols, and of polyhydric into monohydric alcohols; the general properties and the behavior to

various chemical agents. The alcohols of this group are then enumerated in a table giving the structural formulas, production and most characteristic properties; this table opens with methyl alcohol or wood spirit, boiling point 66°C., and closes with myricyl alcohol (from beeswax), melting point 88°C.

All the different groups are considered in a similar manner, and it will be observed that this arrangement is particularly adapted for the general characterization of analogous compounds, and for the study of the general processes by which they may be obtained or converted into compounds of a different order. Those bodies, the constitution of which has been imperfectly ascertained, or is entirely unknown, are grouped together at the end of the work, where we find the alkaloids following the group of pyridine and chinoline, and subsequently terpenes and camphors, glucosides, bitter principles, coloring matters and protein compounds of both the vegetable and animal kingdoms. Detailed descriptions are in all cases omitted, only the most characteristic properties being very briefly mentioned, and the study of color, shape, odor, taste, etc., etc., is very properly left for individual examination of suitable specimens with or without the aid of works of reference.

From the foregoing the scope of the "Grundzüge" will be readily understood. Intended for the use of the student, the immense mass of material is presented, systematically arranged, in such a manner that the general features of cause and effect are displayed, and specializing is confined mainly to few distinctive points. Comprehensiveness and perspicuity throughout the work are deserving of commendation, and especially is this the case with the theoretical themes, which in our opinion, are deduced and explained in a happy and attractive manner, that cannot fail to enlist the attention of the student. The book seems large for a work intended for aiding the beginner in mastering the principles of organic chemistry, and in securing, besides the solid foundation, a secure framework for further special study; but on carefully examining the work it cannot be charged with undue prolixity, and it would be difficult to point out any portion of it that could be advantageously shortened without detriment to the general plan. It should however be stated that the graphic formulas and syllabi of the compounds belonging to the various groups require considerable space. A limited number of wood-cuts has been used in the introductory part of the work. Paper and topography leave nothing to desire.

The National Dispensatory. By Prof. Stillé, M. D., LL.D., and Prof. John M. Maisch, Phar.D. Third edition thoroughly revised, with numerous additions. With 311 illustrations. Philadelphia: Henry C. Lea's Son & Co., 1884. Large 8vo, pp. 1755.

This work has been issued in August. For our next number we hope to receive a critical review of the book, written by a well known pharmacist.

The Druggists' Circular and Chemical Gazette. New York.

We regret to learn that Mr. J. L. A. Creuse has been compelled, by reason of continued illness, to resign his position as editor; in July last he sailed for France, where we hope he may enjoy complete recovery The editorial chair is now occupied by Professor H. B. Parsons, than whom a better selection it would have been difficult to make.

The Student's Guide to Systematic Botany, including the classification of plants and descriptive botany. By Robert Bentley, F.L.S., M.R.C.S. Eng., etc. London: J. & A. Churchill, 1884. 12mo. Pp. 178.

This little work contains the principal natural orders of the British flora yielding medicinal plants, and arranged according to De Candolle's system somewhat modified. These orders and their subdivisions are characterized in the lucid and careful style to which we are accustomed in the author's writings; the characters are fully illustrated and attention is directed to plants presenting these characters. The second part, about one-fourth of the book, is devoted to descriptive botany, explaining the manner in which the student should proceed to examine plants and giving examples of descriptions of 19 familiar medicinal plants, belonging to as many different natural orders. The little volume will doubtless prove of great use to British students entering upon the practical study of botany.

A Short Text-book of Inorganic Chemistry. By Dr. Hermann Kolbe, Professor of Chemistry in the University of Leipzig. Translated and edited by P. S. Humpidge, Ph.D., B.Sc. (London), etc. With a colored table of spectra and numerous wood engravings. New York: John Wiley & Sons, 1884. Pp. 606. Price $2.50 Philadelphia: Porter & Coates.

That Kolbe's work is a good one is saying about as little as possible of a book written by one of the most prominent chemists, whose critical mind is well known. The author's aim is expressed in the preface as being to give an idea of chemical processes and of the most important chemical theories without burdening the memory with a large number of mere facts; to blend them together into one continuous narrative, and thus to prepare students to acquire an accurate knowledge of chemistry by their own practical work. This is what the author insists on, continued practice and thus to learn by clear perception and reflection. The translator and editor has done well his part of the labor, and the external getting up of the book is also creditable. The English-speaking student of chemistry has thus offered to him another good elementary work in addition to those previously placed in his hands.

The Extra Pharmacopœia of Unofficial Drugs and Chemical Preparations. By Wm. Martindale, F.C.S.; with reference to their use, etc., by W. W. Westcott, M.B. Third edition. London: H. K. Lewis, 1884. 16mo, pp. 330.

The second edition was noticed on p. 127 of our present volume, and differs but little from the book now before us; yet the latter contains a number of new formulas and references.

Auscultation, Percussion and Urinalysis. An epitome of the physical signs of the heart, lung, liver, kidney and spleen in health and disease. Edited by Prof. C. Henry Leonard, A.M., M.D. Detroit, Mich.: Illustrated. Med. Journal Co. 12mo, pp. 166. Price $1.

It is illustrated with about 40 wood-cuts.